

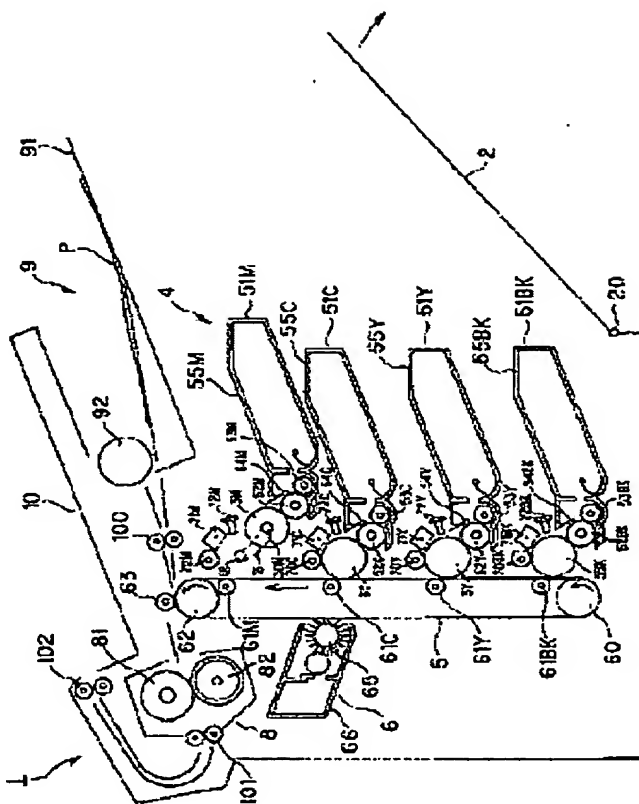
COLOR IMAGE FORMING DEVICE

Patent number: JP2001356548
Publication date: 2001-12-26
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Classification:
 - international: G03G15/00; G03G15/01; G03G15/08; G03G21/00;
 G03G21/10; G03G15/00; G03G15/01; G03G15/08;
 G03G21/00; G03G21/10; (IPC1-7): G03G15/01;
 G03G15/00; G03G15/08; G03G21/00; G03G21/10
 - european:
Application number: JP20000178513 20000614
Priority number(s): JP20000178513 20000614

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Abstract of JP2001356548

PROBLEM TO BE SOLVED: To provide such a color image forming device that an installment area is made reducible, and color slippage does not occur. **SOLUTION:** In this image forming device, an intermediate transfer body 5 is vertically arranged in the upward direction, then photosensitive drum 3M, 3C, 3Y and 3Bk, and processing cartridge respectively consisting of developing device 51M, 51C, 51Y and 51Bk, are disposed along the moving surface thereof. The side face opening/closing cover 2 to be freely opened/closed is disposed on the side surface part opposite to the surface of the intermediate transfer body 5, and the processing cartridge is disposed freely attachably/detachably from the direction of this side face cover 2.



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(19)日本国特許庁 (J P)

(12) 公 開 特 許 公 報 (A)

(11)特許出願公開番号
特開2001-356548
(P2001-356548A)

(43)公開日 平成13年12月26日 (2001. 12. 26)

(51)Int.Cl. ⁷	識別記号	F I	テマコード [*] (参考)
G 0 3 G 15/01		G 0 3 G 15/01	Z 2 H 0 2 7
	1 1 2		1 1 2 A 2 H 0 3 0
	1 1 4		1 1 4 A 2 H 0 3 4
15/00	5 5 0	15/00	5 5 0 2 H 0 7 1
15/08	5 0 7	21/00	3 7 6 2 H 0 7 7
審査請求 未請求 請求項の数 8 O L (全 15 頁) 最終頁に続く			

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(54)【発明の名称】

カラー画像形成装置

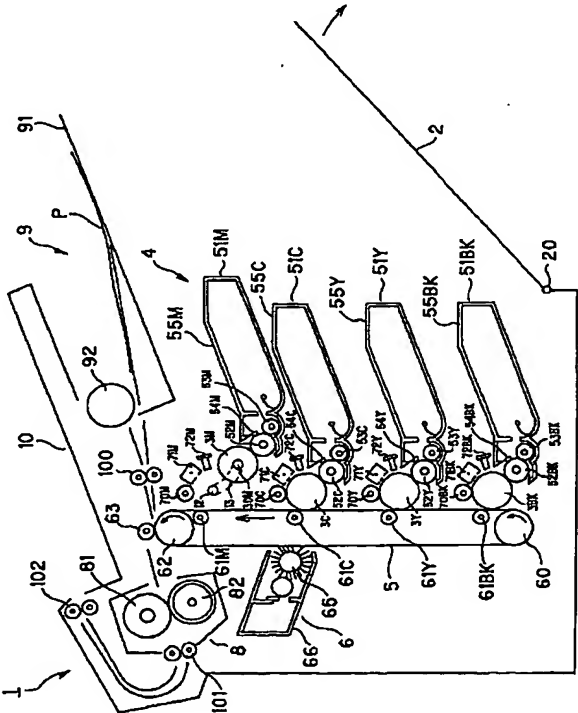
(57)【要約】

【課題】

設置面積を小型化できると共にともに、色ずれを発生させることのないカラー画像形成装置を提供すること。

【解決手段】

中間転写体5を鉛直方向に立てて配置し、その移動する表面に沿って、感光ドラム3M、3C、3Y、3Bkと現像器51M、51C、51Y、51Bkとからなるプロセスカートリッジを配設する。中間転写体5の表面に対向する側の側面部に開閉自在な側面カバー2を設け、プロセスカートリッジをこの側面カバー2の方向から着脱自在に配設する。



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【特許請求の範囲】

【請求項1】 表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体と、
前記表面の移動方向に沿って略鉛直方向に並設された複数の静電潜像担持体と、
前記複数の静電潜像担持体のそれぞれの表面を帯電する複数の帯電手段と、
前記複数の静電潜像担持体のそれぞれの表面の被帯電領域を露光する複数の露光手段と、
前記複数の静電潜像担持体のそれぞれに対向するように配設された複数の現像剤担持体を含む複数の現像手段と、を備え、
少なくとも前記現像手段は、プロセスカートリッジとして前記ベルト状の中間転写体の前記表面に対向する側の側面部から装置本体に着脱自在に配設されている、ことを特徴とするカラー画像形成装置。

【請求項2】 前記複数の露光手段として、前記静電潜像担持体の軸方向に延びて設けられたLEDアレイを装置本体に対して固定的に備えたことを特徴とする請求項1記載のカラー画像形成装置。

【請求項3】 前記プロセスカートリッジは、少なくとも前記現像手段と前記静電潜像担持体とを含み、前記複数のLEDアレイのそれぞれは、前記プロセスカートリッジの装着時における前記静電潜像担持体の軸を含み前記中間転写体の表面に垂直な面を基準として、前記静電潜像担持体の前記中間転写体に対する離脱方向とは反対方向から、前記複数の静電潜像担持体のそれぞれの表面に対して対向するように配設されていることを特徴とする請求項2記載のカラー画像形成装置。

【請求項4】 前記複数の静電潜像担持体のそれぞれに形成した現像剤像を前記中間転写体に転写した後に、各静電潜像担持体上に残留した現像剤を、各静電潜像担持体の移動と共に帯電及び露光を経て前記複数の現像剤担持体のそれぞれによって回収することを特徴とする請求項1ないし3のいずれか1記載のカラー画像形成装置。

【請求項5】 前記プロセスカートリッジは、少なくとも前記現像手段と前記静電潜像担持体とを含み、前記複数の帯電手段は、装置本体側に設けられ、前記プロセスカートリッジの交換時に、前記静電潜像担持体と分離することを特徴とする請求項1ないし4のいずれか1記載のカラー画像形成装置。

【請求項6】 転写媒体を供給する転写媒体供給トレイと、画像形成工程終了後に排出される転写媒体を載置する転写媒体排出トレイとを更に備え、前記転写媒体供給トレイ及び前記プロセスカートリッジの着脱方向、並びに前記転写媒体排出トレイへの転写媒体の排出方向は、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向であることを特徴とする請求項1ないし5のいずれか1記載のカラー画像形成装置。

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【請求項7】 各種の操作ボタン等を含む操作パネルを更に備え、該操作パネルは、その操作方向を、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向とする向きに取り付けられていることを特徴とする請求項6記載のカラー画像形成装置。

【請求項8】 前記複数の静電潜像担持体上の転写残現像剤を回収するクリーニング手段を、前記プロセスカートリッジの外部に備え、該クリーニング手段には、回収した廃現像剤を前記静電潜像担持体の軸方向に搬送する搬送手段が備えられていることを特徴とする請求項1ないし7のいずれか1項に記載のカラー画像形成装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、中間転写体の移動方向に沿って、各色の現像剤により現像される複数の静電潜像担持体を並設し、カラー画像の形成を行うカラー画像形成装置の技術分野に属する。

【0002】

【従来の技術】従来、カラー画像形成装置としては、シアン、マゼンタ、イエロー、及びブラックのトナーを、それぞれ異なる現像器に収容し、これらの現像器と、これらの現像器により現像される静電潜像担持体を鉛直方向または水平方向に並設して成る、所謂タンデム方式のカラー画像形成装置がある。

【0003】このタンデム方式のカラー画像形成装置においては、各色のトナーを収容した各現像器が、略同時に現像動作を行うことができるため、極めて高速にカラー画像を形成することができる。

【0004】

【発明が解決しようとする課題】しかしながら、従来のタンデム方式のカラー画像形成装置は、感光ドラム及び現像装置からなる複数のプロセスユニットを、カラー画像形成装置の設置面に対して略平行に並設する形態をとっているため、設置面積が大きくなるという問題があった。

【0005】そこで、前記複数のプロセスユニットを鉛直方向に並設することにより、設置面積を減少させた装置が、例えば特開平08-190245号公報等に開示されている。

【0006】しかしながら、前記公報等に開示された方式では、排紙トレイが装置の側面から飛び出していたり、あるいは各現像器の構成が複雑で大型のものであるため、カラー画像形成装置全体を小型化することは困難であった。

【0007】更に、従来の装置では、感光ドラムの軸方向に垂直な方向の側板を開閉自在とし、当該側板を開放することにより、前記プロセスユニットを交換するように構成されていた。

【0008】前記側板の側から見た装置の内部には、感

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光ドラムの回転軸を位置決めする手段、あるいは中間転写ベルトの駆動ローラの回転軸を位置決めする手段等があり、これらの手段が邪魔になって前記プロセスユニットの交換が困難であるという問題があった。

【0009】その結果、新しいプロセスユニットが適正な位置に装着されない場合があり、ある色の画像が他の色の画像に対してずれてしまう、所謂色ずれが発生するという問題があった。

【0010】そこで、本発明は、このような問題点を解決し、設置面積を小型化できると共にともに、色ずれを発生させることのないカラー画像形成装置を提供することを課題としている。

【0011】

【課題を解決するための手段】請求項1記載のカラー画像形成装置は、前記課題を解決するために、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体と、前記表面の移動方向に沿って略鉛直方向に並設された複数の静電潜像担持体と、前記複数の静電潜像担持体のそれぞれの表面を帯電する複数の帯電手段と、前記複数の静電潜像担持体のそれぞれの表面の被帯電領域を露光する複数の露光手段と、前記複数の静電潜像担持体のそれぞれに対向するように配設された複数の現像剤担持体を含む複数の現像手段とを備え、少なくとも前記現像手段は、プロセスカートリッジとして前記ベルト状の中間転写体の前記表面に対向する側の側面部から装置本体に着脱自在に配設されていることを特徴とする。

【0012】請求項1記載のカラー画像形成装置によれば、複数の静電潜像担持体のそれぞれが、前記ベルト状の中間転写体の前記表面の移動方向に沿って、略鉛直方向に並設されており、前記複数の帯電手段、複数の露光手段、及び複数の現像手段は、各静電潜像担持体に対向するように配設されている。従って、カラー画像形成装置本体の設置面に対して平行な方向に、前記中間転写体、静電潜像担持体、帯電手段、露光手段、及び現像手段の配置領域を確保する必要がなく、前記設置面に対して垂直な方向に確保すれば良いので、前記設置面の面積の減少化が可能となる。

【0013】また、前記プロセスカートリッジの交換は、前記ベルト状の中間転写体の前記表面に対向する側の側面部から行われるので、前記中間転写体の軸方向両端部に設けられる保持部材、あるいは前記静電潜像担持体の軸方向両端部に設けられる位置決め手段等が、前記交換時に邪魔になることがない。その結果、前記プロセスカートリッジは確実に適正位置に装着されることになり、所謂色ずれの発生を確実に低減する。

【0014】請求項2記載のカラー画像形成装置は、前記課題を解決するために、請求項1記載のカラー画像形成装置において、前記複数の露光手段としてLEDアレイを装置本体に対して固定的に備えたことを特徴とす

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る。

【0015】請求項2記載のカラー画像形成装置によれば、前記静電潜像担持体の軸方向に延びて設けられたLEDアレイをカラー画像形成装置に対して固定的に備えるには、その軸方向の両端部で当該LEDアレイを支持する必要があるが、上述したように、前記プロセスカートリッジの交換は、前記ベルト状の中間転写体の前記表面に対向する側の側面部から行われるので、前記LEDアレイの支持部が、前記交換時に邪魔になることがない。その結果、前記LEDアレイの位置ずれが確実に防止され、所謂色ずれの発生が確実に低減される。

【0016】請求項3記載のカラー画像形成装置は、前記課題を解決するために、請求項2記載のカラー画像形成装置において、前記プロセスカートリッジは、少なくとも前記現像手段と前記静電潜像担持体とを含み、前記複数のLEDアレイのそれぞれは、前記プロセスカートリッジの装着時における前記静電潜像担持体の軸を含み前記中間転写体の表面に垂直な面を基準として、前記静電潜像担持体の前記中間転写体に対する離脱方向とは反対方向から、前記複数の静電潜像担持体のそれぞれの表面に対して対向するように配設されていることを特徴とする。

【0017】請求項3記載のカラー画像形成装置によれば、前記プロセスカートリッジには、少なくとも前記現像手段と前記静電潜像担持体が含まれるが、前記複数のLEDアレイのそれぞれは、前記プロセスカートリッジの装着時における前記静電潜像担持体の軸を含み前記中間転写体の表面に垂直な面を基準として、前記静電潜像担持体の前記中間転写体に対する離脱方向とは反対方向から、前記複数の静電潜像担持体のそれぞれの表面に対して対向しているため、前記静電潜像担持体に近接させて配置する必要のあるLEDアレイを用いた場合でも、前記プロセスカートリッジの離脱の際に当該LEDアレイが邪魔になることはない。その結果、前記プロセスカートリッジが確実に適正位置に装着されると共に、前記LEDアレイの位置ずれが確実に防止され、所謂色ずれの発生を確実に低減する。

【0018】請求項4記載のカラー画像形成装置は、前記課題を解決するために、請求項1ないし3のいずれか1記載のカラー画像形成装置において、前記複数の静電潜像担持体のそれぞれに形成した現像剤像を前記中間転写体に転写した後に、各静電潜像担持体上に残留した現像剤を、各静電潜像担持体の移動と共に帯電及び露光を経て前記複数の現像剤担持体のそれぞれによって回収することを特徴とする。

【0019】請求項4記載のカラー画像形成装置によれば、各静電潜像担持体上の転写残現像剤は、各静電潜像担持体の移動と共に帯電及び露光を経て前記複数の現像剤担持体のそれぞれによって回収されるので、前記転写残現像剤を蓄積しておくための廃現像剤容器が不要とな

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る。従って、前記プロセスカートリッジの交換時に、廃現像剤容器が妨げとならず、所謂色ずれの発生を確実に低減する。

【0020】請求項5記載のカラー画像形成装置は、前記課題を解決するために、請求項1ないし4のいずれか1記載のカラー画像形成装置において、前記プロセスカートリッジは、少なくとも前記現像手段と前記静電潜像担持体とを含み、前記複数の帯電手段は、装置本体側に設けられ、前記プロセスカートリッジの交換時に、前記静電潜像担持体と分離することを特徴とする。

【0021】請求項5記載のカラー画像形成装置によれば、前記帯電手段は、前記プロセスカートリッジの交換時に、静電潜像担持体と分離されるので、当該静電潜像担持体を含むプロセスカートリッジの交換が前記帯電手段に妨げられることなく容易に行われる。従って、前記プロセスカートリッジの交換時における所謂色ずれの発生を確実に防ぐ。

【0022】請求項6記載のカラー画像形成装置は、前記課題を解決するために、請求項1ないし5のいずれか1記載のカラー画像形成装置において、転写媒体を供給する転写媒体供給トレイと、画像形成工程終了後に排出される転写媒体を載置する転写媒体排出トレイとを更に備え、前記転写媒体供給トレイ及び前記プロセスカートリッジの着脱方向、並びに前記転写媒体排出トレイへの転写媒体の排出方向は、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向であることを特徴とする。

【0023】請求項6記載のカラー画像形成装置によれば、前記転写媒体供給トレイの着脱方向及び前記転写媒体排出トレイへの転写媒体の排出方向は、前記プロセスカートリッジの着脱方向と同方向であり、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向なので、装置の小型化を妨げることなく、且つ、前記転写媒体供給トレイの着脱、及び排出された前記転写媒体の取り出しの作業性が向上する。

【0024】請求項7記載のカラー画像形成装置は、前記課題を解決するために、請求項6記載のカラー画像形成装置において、各種の操作ボタン等を含む操作パネルを更に備え、該操作パネルは、その操作方向を、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向とする向きに取り付けられていることを特徴とする。

【0025】請求項7記載のカラー画像形成装置によれば、操作パネルの操作方向も、前記プロセスカートリッジ及び前記転写媒体供給トレイの着脱方向並びに前記転写媒体排出トレイへの転写媒体の排出方向と同方向なので、装置の小型化を妨げることなく、且つ、操作性をより一層向上させる。また、複数の静電潜像担持体を略鉛直方向に並設したことにより、画像形成装置本体の高さ

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が高くなり、上面に操作パネルを設けると操作し難くなるが、本発明では、側面に設けるため、そのような問題が発生することがない。

【0026】請求項8記載のカラー画像形成装置は、前記課題を解決するために、請求項1ないし7のいずれか1項に記載のカラー画像形成装置において、前記複数の静電潜像担持体上の転写残現像剤を回収するクリーニング手段を、前記プロセスカートリッジの外部に備え、該クリーニング手段には、回収した廃現像剤を前記静電潜像担持体の移動軸方向に搬送する搬送手段が備えられていることを特徴とする。

【0027】請求項8記載のカラー画像形成装置によれば、クリーニング手段は前記プロセスカートリッジに含まれないので、前記プロセスカートリッジの交換時に前記クリーニング手段が邪魔になることはない。従って、前記プロセスカートリッジの交換時における所謂色ずれの発生を確実に防ぐ。また、回収した廃現像剤は、搬送手段によって前記静電潜像担持体の移動軸方向に搬送されるので、搬送した後は、重力で下方に落下させることが可能であり、クリーニング手段が前記プロセスカートリッジに含まれない場合でも廃現像剤の処理が的確に行われることになる。

【0028】

【発明の実施の形態】以下、本発明の実施の形態を添付図面に基づいて説明する。

(第1の実施形態)

【0029】まず、本発明の第1の実施形態を図1に基づいて説明する。図1は、本発明が適用されたカラー画像形成装置としてのカラーレーザープリンタの概略側断面図である。

【0030】図1に例示するカラー画像形成装置1は、可視像形成部4と、ベルト状の中間転写体5と、定着ユニット8と、給紙ユニット9と、排紙トレイ10とを備えている。

【0031】可視像形成部4は、マゼンタ(M)、シアン(C)、イエロー(Y)、及びブラック(Bk)のそれぞれのトナーによる可視像工程ごとに、現像器51M、51C、51Y、51Bkと、感光ドラム3M、3C、3Y、3Bk、クリーニングローラ70M、70C、70Y、70Bk、帯電器71M、51C、51Y、51Bk、及びLEDアレイ72M、72C、72Y、72Bkが備えられている。以下、これらの各構成要素について詳しく説明する。

【0032】まず、現像器51M、51C、51Y、51Bkには、現像剤担持体としての現像ローラ52M、52C、52Y、52Bkが備えられている。現像ローラ52M、52C、52Y、52Bkは、導電性シリコーンゴムを基材として円柱状に構成され、更に、表面にフッ素を含有した樹脂またはゴム材のコート層が形成されている。なお、現像ローラ52M、52C、52Y、

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52Bkは、必ずしも基材を導電性シリコンゴムで構成しなくてもよく、導電性ウレタンゴムで構成しても良い。そして、表面の十点平均粗さ(Rz)は、3~5 μ mに設定しており、トナーの平均粒径である9 μ mよりも小さくなるように構成している。また、現像ローラ52M、52C、52Y、52Bkには所定の電圧が印加されており、感光ドラム3M、3C、3Y、3Bkとの間に所定の電位差を有するように構成されている。

【0033】各現像器51M、51C、51Y、51Bkには、また、供給ローラ53M、53C、53Y、53Bkが備えられている。供給ローラ53M、53C、53Y、53Bkは、導電性のスポンジローラであり、現像ローラ52M、52C、52Y、52Bkに対してスポンジの弾性力によって押圧接触するように配置されている。なお、供給ローラ53M、53C、53Y、53Bkとしては、この他にも、導電性シリコンゴムあるいはウレタンゴム等の適宜の部材を使用することができる。

【0034】各現像器には、更に、層厚規制ブレード54M、54C、54Y、54Bkが備えられている。層厚規制ブレードブレード54M、54C、54Y、54Bkは、ステンレス鋼等で形成され、基端が現像器ケース55M、55C、55Y、55Bkに固定された支持部54aM、54aC、54aY、54aBkと、その支持部54aM、54aC、54aY、54aBkの先端に設けられ、導電性のシリコンゴムや導電性のフッ素含有ゴムまたは樹脂で形成された接触部54bM、54bC、54bY、54bBkとを備えている。接触部54bM、54bC、54bY、54bBkは支持部54aM、54aC、54aY、54aBkの弾性力により現像ローラ52M、52C、52Y、52Bkに圧接される。接触部54bM、54bC、54bY、54bBkの形状は、図1に示すように、断面が略半月状の凸形状となるように形成している。また、本実施形態においては、層厚規制ブレード54M、54C、54Y、54Bkに対しても現像ローラ52M、52C、52Y、52Bkと連動して所定の電圧を印加している。

【0035】また、現像器ケース55M、55C、55Y、55Bkに収納されるトナーは、正帯電性の非磁性1成分現像剤であり、懸濁重合によって球状に形成したスチレン-アクリル系樹脂に、カーボンブラック等の周知の着色剤、及びニグロシン、トリフェニルメタン、4級アンモニウム塩等の荷電制御剤、または荷電制御樹脂を添加してなる平均粒径9 μ mのトナー母粒子を有している。そして、前記トナーTは、そのトナー母粒子の表面にシリカを外添剤として添加して構成されている。また、前記外添剤としてのシリカには、シランカップリング剤、シリコンオイル等による周知の疎水化処理が施され、平均粒径が10nmで、その添加量はトナー母粒子の0.6重量%である。各現像器ケース55M、55

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C、55Y、55Bk毎に、それぞれマゼンタ、シアン、イエロー、ブラックのトナーが収容されている。

【0036】このように、トナーは極めて球状に近い懸濁重合トナーであり、しかも、平均粒径が10nmの疎水性処理したシリカを0.6重量%、外添剤として添加しているため、極めて流動性に優れている。そのため、摩擦帯電により十分な帯電量が得られる。更に、粉砕トナーのように角部が存在しないため、機械的な力を受けにくく、電界に対する追従性に優れ、転写効率が良い。

【0037】静電潜像担持体としての感光ドラム3M、3C、3Y、3Bkは、一例として、アルミニウム製の基材上に、正帯電性の感光層が形成されたものを用いる。感光層の厚さは、18 μ m以上に形成されており、また、前記アルミニウム製の基材は、アース層として用いられている。更に、感光ドラム3M、3C、3Y、3Bkは、図1に示す矢印方向に回転駆動される。

【0038】クリーニング手段としてのクリーニングローラ70M、70C、70Y、70Bkは、スポンジ等の導電性弾性体からなるローラであり、感光ドラム3M、3C、3Y、3Bkに摺擦するように構成されている。このクリーニングローラ70M、70C、70Y、70Bkには、図示しない電源により、トナーの逆極性の負極性の電圧が印加されるように構成されており、感光ドラム3M、3C、3Y、3Bkに対する摺擦力及び前記電圧による電界の作用により、残留トナーを感光ドラム3M、3C、3Y、3Bkから除去するように構成されている。なお、本実施形態では、所謂クリーナレス現像方式を採用しているため、現像工程が終了した後の所定のサイクルにおいて、一旦クリーニングローラ70M、70C、70Y、70Bkによって除去した残留トナーを再び感光ドラム3M、3C、3Y、3Bk側に戻すことも可能に構成されている。

【0039】帯電手段としての帯電器71M、71C、71Y、71Bkは、スコトロロン型の帯電器であり、前記クリーニングローラ70M、70C、70Y、70Bkよりも、前記感光ドラム3M、3C、3Y、3Bkの回転方向下流側において、前記感光ドラム3M、3C、3Y、3Bkの表面に対向して配設されている。なお、帯電器71M、71C、71Y、71Bkとして、感光ドラム3M、3C、3Y、3Bkに接触するローラ型の帯電器を用いるようにしても良い。

【0040】露光手段としてのLEDアレイ72M、72C、72Y、72Bkは、前記帯電器71M、71C、71Y、71Bkよりも、前記感光ドラム3M、3C、3Y、3Bkの回転方向下流側において、前記感光ドラム3M、3C、3Y、3Bkの表面に対向して配設されている。露光手段72M、72C、72Y、72Bkにより、描画データに応じた光が感光ドラム3M、3C、3Y、3Bkの表面上に照射され、感光ドラム3M、3C、3Y、3Bkの表面上には、各色ごとの静電

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潜像が形成される。

【0041】以上のような構成により、現像ローラ52M、52C、52Y、52Bkと感光ドラム3M、3C、3Y、3Bkとの接触部において、感光ドラム3M、3C、3Y、3Bk上に形成されたプラス極性（正帯電）の静電潜像に対して、正に帯電したトナーを反転現像方式で良好に現像することができ極めて高画質な画像を形成できる。

【0042】また、本実施形態においては、感光ドラム3M、3C、3Y、3Bkと、現像器51M、51C、51Y、51Bkは、プロセスカートリッジとして形成され、図2に示すように、装置本体に対して着脱自在に設けられている。これに対し、クリーニングローラ70M、70C、70Y、70Bk、帯電器71M、71C、71Y、71Bk、及びLEDアレイ72M、72C、72Y、72Bkは、装置本体に対して固定的に設けられている。

【0043】ベルト状の中間転写体5は、ポリカーボネイト、またはポリイミド等の導電性のシートをベルト状に形成したものである。ベルト状の中間転写体5は、図1に示すように、2つの駆動ローラ60、62に架け渡されており、感光ドラム3M、3C、3Y、3Bkとの対向位置近傍には、中間転写ローラ61M、61C、61Y、61Bkが設けられている。中間転写体5の感光ドラム3M、3C、3Y、3Bkと対向する側の表面の移動方向は、図1に示すように、鉛直方向下方向から上方向へ移動する方向に設定されている。

【0044】中間転写ローラ61M、61C、61Y、61Bkには、所定の電圧が印加されており、感光ドラム3M、3C、3Y、3Bk上に形成されたトナー像を前記導電性のシートからなるベルト状の中間転写体5に転写するように構成されている。また、トナー像を用紙への転写する位置におけるローラ62には、ローラ63が対向して設けられており、ローラ63にも所定の電位が印加されている。その結果、ベルト状の中間転写体5上に担持された4色のトナー像は、用紙に転写されることになる。

【0045】なお、中間転写体5の感光ドラム3M、3C、3Y、3Bkとの対向側と反対の側には、図1に示すように、クリーニング器6が設けられている。クリーニング器6は、導電性ブラシからなる掻き取り部材65と、ケース66とから構成されており、中間転写体5上に残留したトナーを掻き取り部材65によって電気的に掻き取り、ケース66に收容する。

【0046】定着ユニット8は、加熱ローラ82と、加圧ローラ81とから構成され、4色のトナー像を担持した用紙を、加熱ローラ82及び加圧ローラ81によって挟持搬送しながら加熱及び加圧することにより、前記トナー像を用紙に定着させる。

【0047】給紙ユニット9は、用紙Pを收容する收容

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トレイ91と、用紙を送り出すピックアップローラ92とから構成されている。給紙ユニット9は、LEDアレイ72M、72C、72Y、72Bk、可視像ユニット4、感光ドラム3M、3C、3Y、3Bk、及び中間転写体5による画像形成工程と所定のタイミングをとって用紙Pを供給するように構成されている。給紙ユニット9から供給された用紙Pは、搬送ローラ対100によって中間転写体5とローラ63との圧接部に搬送される。

【0048】排紙トレイ10は、前記定着ユニット8の排紙側に設けられており、前記定着ユニット8から排出され、搬送ローラ対101、102によって搬送される用紙Pを收容するように構成されている。

【0049】次に、以上のような本実施形態におけるカラー画像形成装置の動作について説明する。まず、感光ドラム3M、3C、3Y、3Bkの感光層が帯電器71M、71C、71Y、71Bkにより一様に帯電され、次に、これらの感光層は、LEDアレイ72M、72C、72Y、72Bkにより照射されたマゼンタ色、シアン色、イエロー色、及びブラック色の画像に対応したLED光により露光される。そして、マゼンタ現像器51M、シアン現像器51C、イエロー現像器51Y、ブラック現像器51Bkによって、感光ドラム3M、3C、3Y、3Bkの感光層上に形成された静電潜像に、それぞれマゼンタトナー、シアントナー、イエロートナー、及びブラクトナーを付着させ、マゼンタ色、シアン色、イエロー色、及びブラック色の現像を行う。このようにして形成されたマゼンタ色、シアン色、イエロー色、及びブラック色のトナー像は、一旦、中間転写体5の表面上に転写される。

【0050】次に、転写後の感光ドラム3M、3C、3Y、3Bkに残ったトナーは、クリーニングローラ70M、70C、70Y、70Bkによって除去される。

【0051】各色のトナー像は、中間転写体5の移動速度及び各感光ドラム3M、3C、3Y、3Bkの位置に合わせて、若干の時間差を持って形成されるように構成されており、それぞれの色のトナー像が中間転写体5上で重ね合わされるように転写される。

【0052】以上のようにして中間転写体5上に形成された4色のトナー像は、給紙ユニット9から供給される用紙P上に、ローラ63と中間転写体5との圧接位置において転写される。そして、このトナー像は、定着ユニット8において用紙P上に定着され、排紙トレイ10上に排出される。以上のようにして、4色カラー画像が形成されることになる。

【0053】以上のように、本実施形態のカラー画像形成装置は、各色ごとの可視像形成部4が、中間転写体5の移動方向に沿って配設された、所謂タンデム方式を採用しているので、単色の画像形成の場合と同程度に高速にカラー画像を形成することができる。

【0054】なお、本実施形態では、中間転写体5とし

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てベルト状のものをを用いているので、可視像形成部に対向する面を長く取ることができ、上述のように、全ての可視像形成部を縦方向に並設することができる。その結果、従来の横置き型に比べて、装置本体の設置面積を小さくすることができる。

【0055】そして、本実施形態においては、図1に示すように、側面カバー2が軸20を中心に図1の矢印方向に回動可能に構成されている。図2は側面カバー2を開放した状態を示している。このように構成することにより、前記現像器51M、51C、51Y、51Bkの交換を容易に行うことができる。なお、軸20は水平方向に平行であるが、鉛直方向に平行として、その軸回りに側面カバーを開放することも可能である。

【0056】本実施形態のレーザビームプリンタ1には、図3に示すように、中間転写体5の回転軸方向の両端に、フレーム11A、11Bが設けられている。フレーム11A、11Bは、中間転写体5の駆動ローラ60、62における回転軸の位置決め部材、及び感光ドラム3M、3C、3Y、3Bkの回転軸の位置決め部材、並びにLEDアレイ72M、72C、72Y、72Bkの支持部材として用いられている。なお、図3は、説明を簡単にするために、側面カバー2が設けられた側面部側から、現像器51M、51C、51Y、51Bkを取り除いた場合のフレーム11A、11Bと、感光ドラム3M、3C、3Y、3Bk及びLEDアレイ72M、72C、72Y、72Bkとの位置関係を示す図である。

【0057】フレーム11A、11Bには、図2に示すように、感光ドラム3Mの回転軸30Mに対する位置決め孔12と、回転軸30Mを位置決め孔12に案内するガイド溝13とが形成されている。この構成は、他の感光ドラム3C、3Y、3Bkの回転軸30C、30Y、30Bkについても同様であり、図3に示すように各回転軸30M、30C、30Y、30Bkが、フレーム11A、11Bによって位置決めされている。

【0058】従って、本実施形態においてプロセスカートリッジの交換は、中間転写体5の表面に対向した側面部に設けられた側面カバー2を図2に示すように開放することにより行うことができるので、フレーム11A、11Bが交換作業の妨げになることはない。つまり、容易にプロセスカートリッジの交換を行うことができるので、回転軸30Mを位置決め孔12に取り付けるように、プロセスカートリッジを確実に適正な配設位置に装着することができる。その結果、各プロセスカートリッジの位置ずれが無いので、特定の色の画像だけが他の色の画像に対してずれてしまう所謂色ずれの発生を確実に防止することができる。

【0059】また、本実施形態においては、LEDアレイ72M、72C、72Y、72Bkは、図3に示すようにフレーム11A、11Bに取り付けられ、装置本体に対して固定的に設けられている。そして、ガイド溝1

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3は、位置決め孔12の下方に延びており、LEDアレイ72は、位置決め孔12の上方に設けられている。つまり、感光ドラム3M、3C、3Y、3Bkは中間転写体5から離脱する時に下方向（請求項3の離脱方向に）に移動する。従って、上述したようにプロセスカートリッジはこれらのLEDアレイ72M、72C、72Y、72Bkを支持するフレーム11A、11Bと干渉することなく着脱可能である。従って、プロセスカートリッジの交換作業を行っても、LEDアレイ72M、72C、72Y、72Bkの位置がずれてしまうことがなく、この点からも色ずれの発生を確実に防止することができる。

【0060】また、本実施形態では、所謂クリーナレス現像方式を採用しているため、現像工程が終了した後の所定のサイクルにおいて、一旦クリーニングローラ70M、70C、70Y、70Bkによって除去した残留トナーを再び感光ドラム3M、3C、3Y、3Bk側に戻すことも可能に構成されている。従って、本実施形態では廃トナーボックスを設ける必要がない。クリーナレス現像方式を採用していない従来の装置においては、感光ドラムの周辺に廃トナーボックスを設ける必要があり、プロセスカートリッジの交換の際に感光ドラムと廃トナーボックスが干渉して交換作業が困難になるという問題があった。しかし、本実施形態では、廃トナーボックスを設ける必要がないので、このような問題がなく、容易にプロセスカートリッジの交換を行うことができる。この点からも色ずれの発生を確実に防止することができる。

【0061】更に、本実施形態においては、帯電器71M、71C、71Y、71Bkが、プロセスカートリッジの交換時に、図2に示すように感光ドラム3M、3C、3Y、3Bkから分離するように構成されている。従って、前記プロセスカートリッジの交換作業は、これらの帯電器71M、71C、71Y、71Bkによっても妨げられることはなく、この点からも色ずれの発生を確実に防止することができる。

【0062】また、本実施形態においては、図2に示すように、排紙トレイ10において用紙Pが排出される方向と、プロセスカートリッジの着脱方向が同一の方向になるように構成されている。更には、給紙トレイ9の着脱方向も同一の方向になるように構成されている。従って、装置の小型化を実現できると共に、操作性の良いレーザビームプリンタを提供することができる。更に、図4に示すように、操作パネル15が側面の右上に設けられている。従って、プロセスカートリッジの交換の際の側面カバー2の開閉方向、排出された用紙の取り出し方向、及び操作パネル15の操作方向が全て同一方向であり、極めて操作性の良いレーザビームプリンタを提供することができる。更に、複数の感光ドラム3M、3C、3Y、3Bkを略鉛直方向に並設したことにより、画像

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形成装置本体の高さが高くなるが、操作パネル15を側面に設けるため操作性が良い。

【0063】(第2の実施形態)次に、本発明の第2の実施形態を図5ないし図7に基づいて説明する。なお、第1の実施形態との共通箇所には同一符号を付して説明を省略する。

【0064】本実施形態は、図5に示すように、中間転写体5の感光ドラム3M、3C、3Y、3Bkに対向する表面の移動方向が鉛直方向上方向から下方向に向かっているところが第1の実施形態と異なる。

【0065】中間転写体5をこのように構成した場合には、図5に示すように、給紙ユニット9及び転写用のローラ63の位置は、中間転写体5よりも下方に位置することになる。

【0066】更に、各感光ドラム3M、3C、3Y、3Bkの回転方向が、図2に示すように、反時計回りとなるため、それに合わせて、クリーニング手段73M、73C、73Y、73Bk、及び帯電器71M、71C、71Y、71Bk、並びにLEDアレイ72M、72C、72Y、72Bkの位置も感光ドラム3M、3C、3Y、3Bkに対して下方に設定される。

【0067】更に、層厚規制ブレード54M、54C、54Y、54Bkの位置も、現像ローラ52M、52C、52Y、52Bkに対して下方に設定される。

【0068】また、本実施形態は、図1に示したような通常用の紙搬送パスの他に、図5に示すように、両面印字用の紙搬送パスを備えている点が第1の実施形態と異なる。本実施形態においては、定着ユニット8の排紙部に設けられた搬送ローラ対101と、更に用紙Pの搬送方向下流側に設けられた搬送ローラ対103との間に、経路切り換え板104が設けられており、前記搬送ローラ対103から、2次転写手段としてのローラ63よりも用紙Pの搬送方向上流側に設けられた搬送ローラ対108までの間には、両面印字用紙搬送経路105と、搬送ローラ対106、107が設けられている。

【0069】本実施形態において両面印字を行う場合には、まず、経路切り換え板104を図5に示す位置に設定しておく。次に、定着ユニット8から排出された用紙Pを搬送ローラ対103により途中まで搬送し、用紙Pの後端部が搬送ローラ対103から排出される寸前で一旦搬送を停止させる。次に、経路切り換え板104を図5に示す時計方向に回転させて搬送ローラ対103を逆回転させ、搬送ローラ対103、106、107により用紙Pを両面印字用搬送経路105に供給する。そして、搬送ローラ対108により、用紙Pをローラ63と中間転写体5との圧接部に搬送することにより、用紙Pの裏面への印字が可能となる。このように両面印字が可能なので、用紙Pの節約に寄与することができる。

【0070】そして、本実施形態においても、図6に示すように開閉自在な側面カバー2は、中間転写体5の表

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面に対向する側の側面部に設けられているので、上述したフレームとの干渉を起こさずに、プロセスカートリッジを容易に着脱することができる。

【0071】しかも、本実施形態においては、プロセスカートリッジを図6に示すように上方向に抜き取る構成であるのに対し、LEDアレイ72M、72C、72Y、72Bkは、その抜き取り方向とは反対の下方向に位置している。従って、LEDアレイ72M、72C、72Y、72Bkがプロセスカートリッジの抜き取りの際の邪魔になることがない。LEDアレイ72M、72C、72Y、72Bkは、その特性上、感光ドラム3M、3C、3Y、3Bkに近接して配置する必要があるが、本実施形態のように構成することにより、交換作業の妨げになることはない。従って、プロセスカートリッジの交換を行ってもLEDアレイ72M、72C、72Y、72Bkの位置ずれが生じないので、色ずれの発生を確実に抑えることができる。

【0072】また、本実施形態のクリーニング手段73M、73C、73Y、73Bkは、図7(A)に示すように、容器74M、74C、74Y、74Bkと、ブレード75M、75C、75Y、75Bkと、搬送手段としてのスクリー76M、76C、76Y、76Bkとから構成されている。

【0073】スクリー76M、76C、76Y、76Bkは、図7(B)に示すように、感光ドラム3M、3C、3Y、3Bkの回転軸方向に延びて形成されており、各容器74M、74C、74Y、74Bkは、連結パイプ77により、長手方向の一端側で連結されている。、該連結パイプ77は、下方位置にて廃トナー収容器78に連結されている。

【0074】本実施形態は、このように、廃トナー収容器78を装置本体の最下部に設ける構成なので、廃トナー収容器78がプロセスカートリッジの交換作業の妨げになることはない。また、このようにクリーニング手段73M、73C、73Y、73Bkを、プロセスカートリッジに含ませず、更にクリーナレス方式を採用しない場合であっても、廃トナーを確実に処理することができる。特に、廃トナー収容器78は装置本体の最下部の一カ所に設けられているので、各色の感光ドラム付近ごとに設ける場合に比べて、交換作業の煩雑を低減することができる。また、本実施形態は縦置きタンデム方式を採用しているため、廃トナーをスクリー76M、76C、76Y、76Bkにより連結パイプ77まで搬送した後は、廃トナーを重力によって落下させることができ、構成の簡易化を図ることができる。

【0075】(第3の実施形態)次に、本発明の第3の実施形態を図8に基づいて説明する。なお、第1の実施形態との共通箇所には同一符号を付して説明を省略する。

【0076】本実施形態は、図8に示すように、ベルト

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状の中間転写体5を若干斜め方向に配置したところが第1の実施形態と異なる。

【0077】このように、ベルト状の中間転写体5を若干斜め方向に配置した場合でも、装置の設置面積を減少させることができる。

【0078】本実施形態においても、側面カバー2は、中間転写体5の表面に対向する側の側面部に設けられているので、プロセスカートリッジの交換作業はフレームに妨げられることなく容易に行うことができる。従って、色ずれの発生を確実に抑えることができる。

【0079】また、本実施形態においては、操作パネル15が、側面カバー2の設けられた側面部の最上位置に設けられている。従って、プロセスカートリッジの交換の際の側面カバー2の開閉方向、排出された用紙の取り出し方向、及び操作パネル15の操作方向が全て同一方向であり、極めて操作性の良いレーザビームプリンタを提供することができる。また、側面カバー2が設けられた装置本体の側面の上部に傾斜面を設けて、その傾斜面に操作パネル15を配置しても、前記の効果を得ることができる。つまり、側面カバー2が設けられている側に操作パネル15を設ければよい。

【0080】なお、本発明は、懸濁重合トナー以外の非磁性1成分現像剤を用いた画像形成装置、例えば、乳化重合等によって得られた他の重合トナーを用いた画像形成装置にも、同様に適用することができる。

【0081】

【発明の効果】以上説明したように、請求項1に記載のカラー画像形成装置によれば、所謂縦置き型タンデム方式のカラー画像形成装置なので、設置面の面積を減少することができる。しかも、プロセスカートリッジをベルト状の中間転写体の表面に対向する側の側面部から着脱自在に配設したので、プロセスカートリッジの交換作業が容易であり、確実に適正位置に装着することができるので、所謂色ずれの発生を確実に低減することができる。

【0082】請求項2記載のカラー画像形成装置によれば、前記静電潜像担持体の軸方向に延びて設けられたLEDアレイをカラー画像形成装置に対して固定的に備えるには、その軸方向の両端部で当該LEDアレイを支持する必要があるが、上述したように、前記プロセスカートリッジの交換は、前記ベルト状の中間転写体の前記表面に対向する側の側面部から行われるので、前記LEDアレイの支持部が、前記交換時に邪魔になることがない。その結果、前記LEDアレイの位置ずれが確実に防止され、所謂色ずれの発生を確実に低減することができる。

【0083】請求項3記載のカラー画像形成装置によれば、前記プロセスカートリッジには、少なくとも前記現像手段と前記静電潜像担持体が含まれるが、前記複数のLEDアレイのそれぞれは、前記プロセスカートリッジ

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の前記中間転写体に対する離脱方向とは反対方向から、前記複数の静電潜像担持体のそれぞれの表面に対して対向しているので、前記静電潜像担持体に近接させて配置する必要のあるLEDアレイを用いた場合でも、前記プロセスカートリッジの離脱の際に当該LEDアレイが邪魔になることはない。その結果、前記プロセスカートリッジが確実に適正位置に装着されると共に、前記LEDアレイの位置ずれが確実に防止され、所謂色ずれの発生を確実に低減することができる。

10 【0084】請求項4記載のカラー画像形成装置によれば、各静電潜像担持体上の転写残現像剤は、各静電潜像担持体の移動と共に帯電及び露光を経て前記複数の現像剤担持体のそれぞれによって回収されるので、前記転写残現像剤を蓄積しておくための廃現像剤容器が不要となる。従って、前記プロセスカートリッジの交換時に、廃現像剤容器が妨げとならず、所謂色ずれの発生を確実に低減することができる。

20 【0085】請求項5記載のカラー画像形成装置によれば、前記帯電手段は、前記プロセスカートリッジの交換時に、静電潜像担持体と分離されるので、当該静電潜像担持体を含むプロセスカートリッジの交換が前記帯電手段に妨げられることなく容易に行われる。従って、前記プロセスカートリッジの交換時における所謂色ずれの発生を確実に防ぐことができる。

30 【0086】請求項6記載のカラー画像形成装置によれば、前記転写媒体供給トレイの着脱方向及び前記転写媒体排出トレイへの転写媒体の排出方向は、前記プロセスカートリッジの着脱方向と同方向であり、表面が略鉛直方向に沿って移動するように設けられたベルト状の中間転写体の該表面に対向する方向なので、装置の小型化を妨げることなく、且つ、前記転写媒体供給トレイの着脱、及び排出された前記転写媒体の取り出しの作業性を向上させることができる。

【0087】請求項7記載のカラー画像形成装置によれば、操作パネルの操作方向も、前記プロセスカートリッジ及び前記転写媒体供給トレイの着脱方向並びに前記転写媒体排出トレイへの転写媒体の排出方向と同方向なので、装置の小型化を妨げることなく、且つ、操作性をより一層向上させることができる。

40 【0088】請求項8記載のカラー画像形成装置によれば、クリーニング手段は前記プロセスカートリッジに含まれないので、前記プロセスカートリッジの交換時に前記クリーニング手段が邪魔になることはない。従って、前記プロセスカートリッジの交換時における所謂色ずれの発生を確実に防ぐ。また、回収した廃現像剤は、搬送手段によって前記静電潜像担持体の移動軸方向に搬送されるので、搬送した後は、重力で下方に落下させることが可能であり、クリーニング手段が前記プロセスカートリッジに含まれない場合でも廃現像剤の処理が的確に行うことができる。

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【図面の簡単な説明】

【図1】本発明の第1の実施形態におけるレーザビームプリンタの概略側断面図である。

【図2】図1のレーザビームプリンタの側面カバーを開放し、プロセスカートリッジを交換する状態を示す概略側断面図である。

【図3】図1のレーザビームプリンタの内部を図1の側面カバーが設けられた側から見た時の感光ドラムとLEDアレイとフレームとの位置関係を示す図である。

【図4】図1のレーザビームプリンタの操作パネルが設けられた側面カバー側を示す図である。

【図5】本発明の第2の実施形態におけるレーザビームプリンタの概略側断面図である。

【図6】図5のレーザビームプリンタの側面カバーを開放し、プロセスカートリッジを交換する状態を示す概略側断面図である。

【図7】(A)は図5のレーザビームプリンタにおけるクリーニング手段の構成を示す図、(B)は(A)のクリーニング手段における搬送手段と、廃トナー容器とを示す図である。

【図8】本発明の第3の実施形態におけるレーザビームプリンタの概略側断面図である。

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【符号の説明】

1…レーザビームプリンタ

2…側面カバー

3M、3C、3Y、3Bk…感光ドラム

5…中間転写体

8…定着ユニット

9…給紙ユニット

10…排紙トレイ

11A、11B…フレーム

15…操作パネル

51M、51C、51Y、51Bk…現像器（プロセスカートリッジ）

52M、52C、52Y、52Bk…現像ローラ

70M、70C、70Y、70Bk…クリーニングローラ

71M、71C、71Y、71Bk…帯電器

72M、72C、72Y、72Bk…LEDアレイ

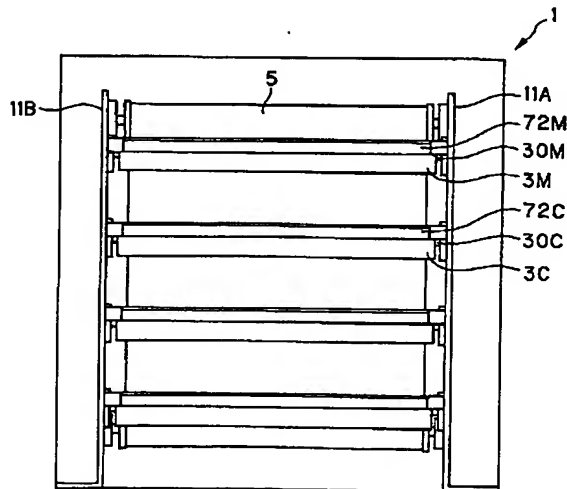
73M、73C、73Y、73Bk…クリーニング手段

76M、76C、76Y、76Bk…スクレーパー

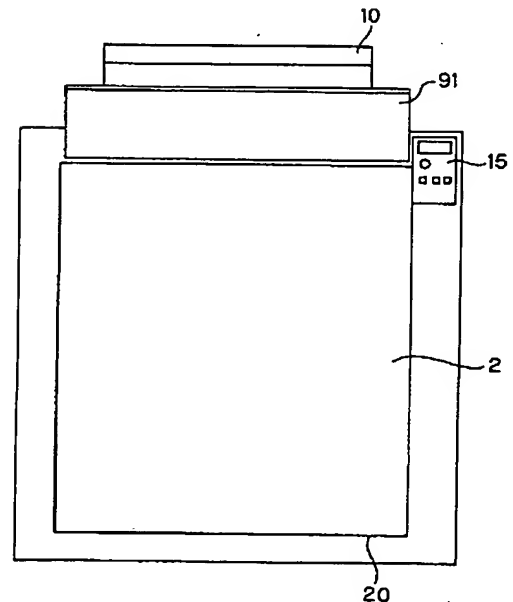
78…廃トナー回収容器

91…給紙トレイ

【図3】

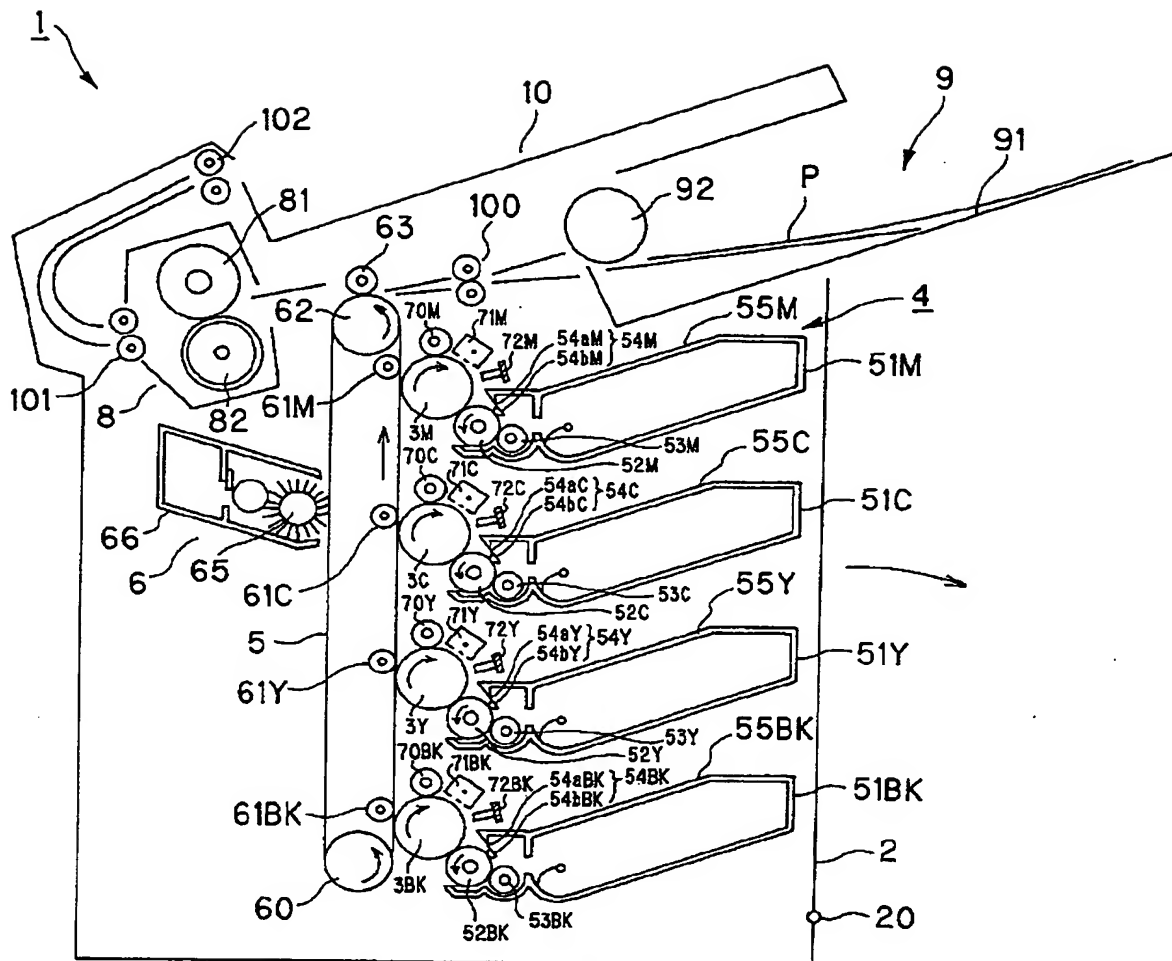


【図4】

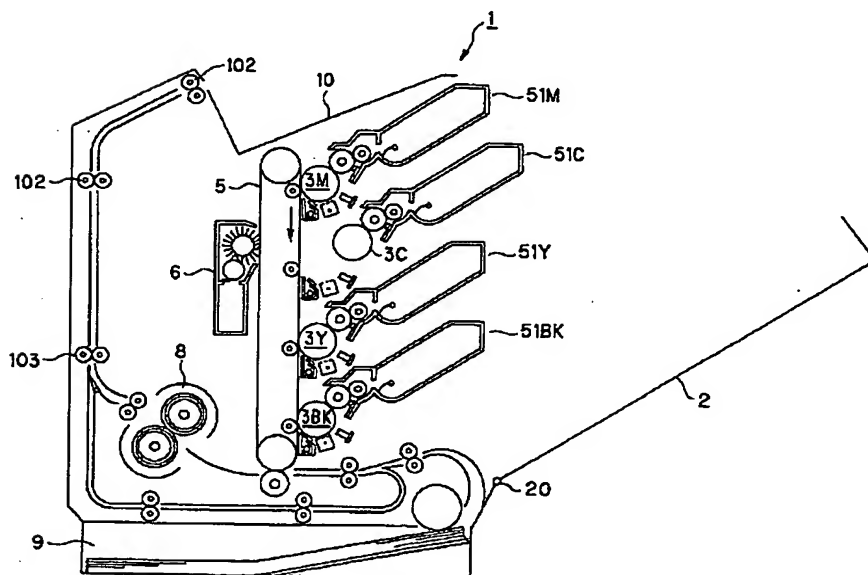


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【図1】

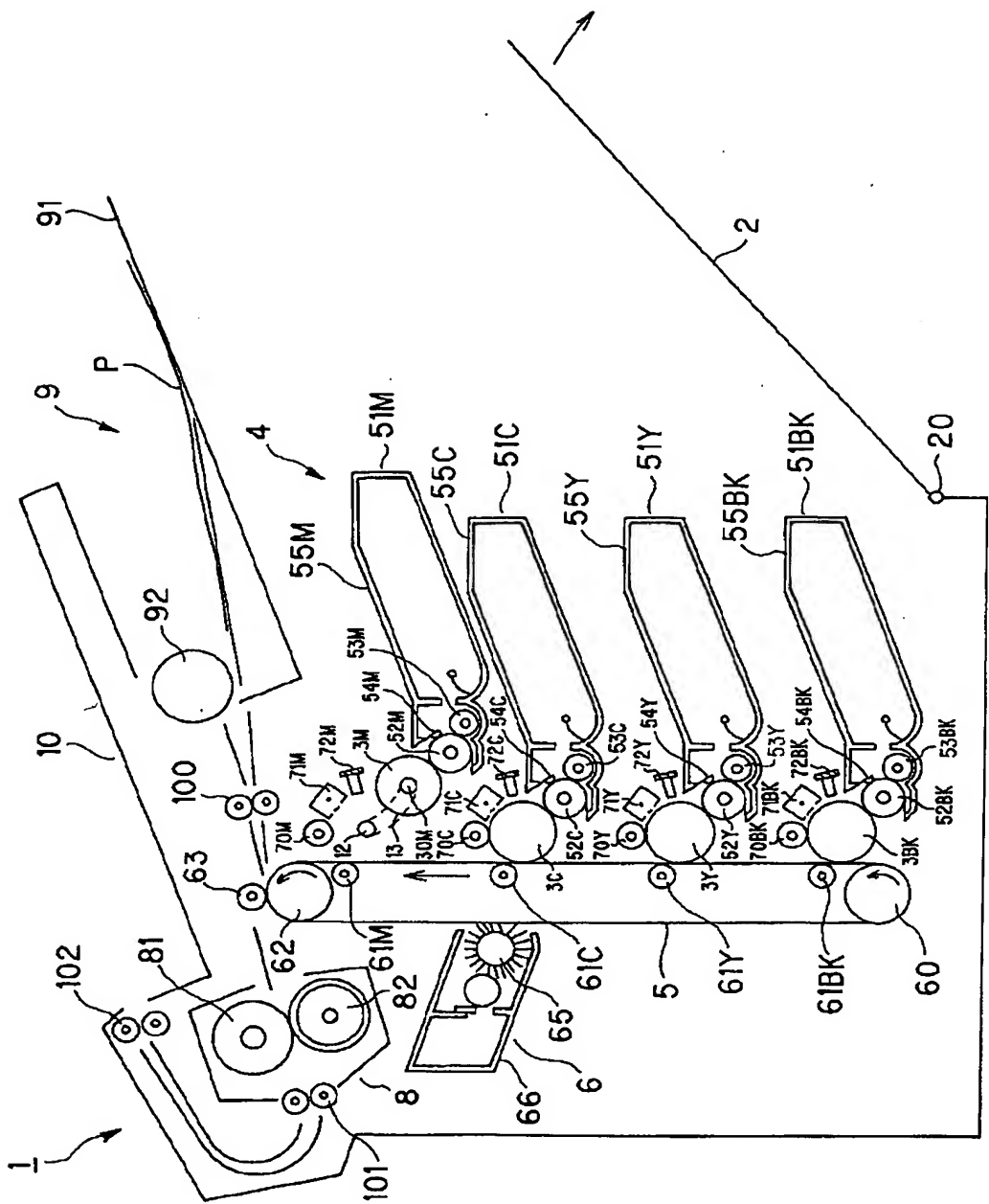


【図6】



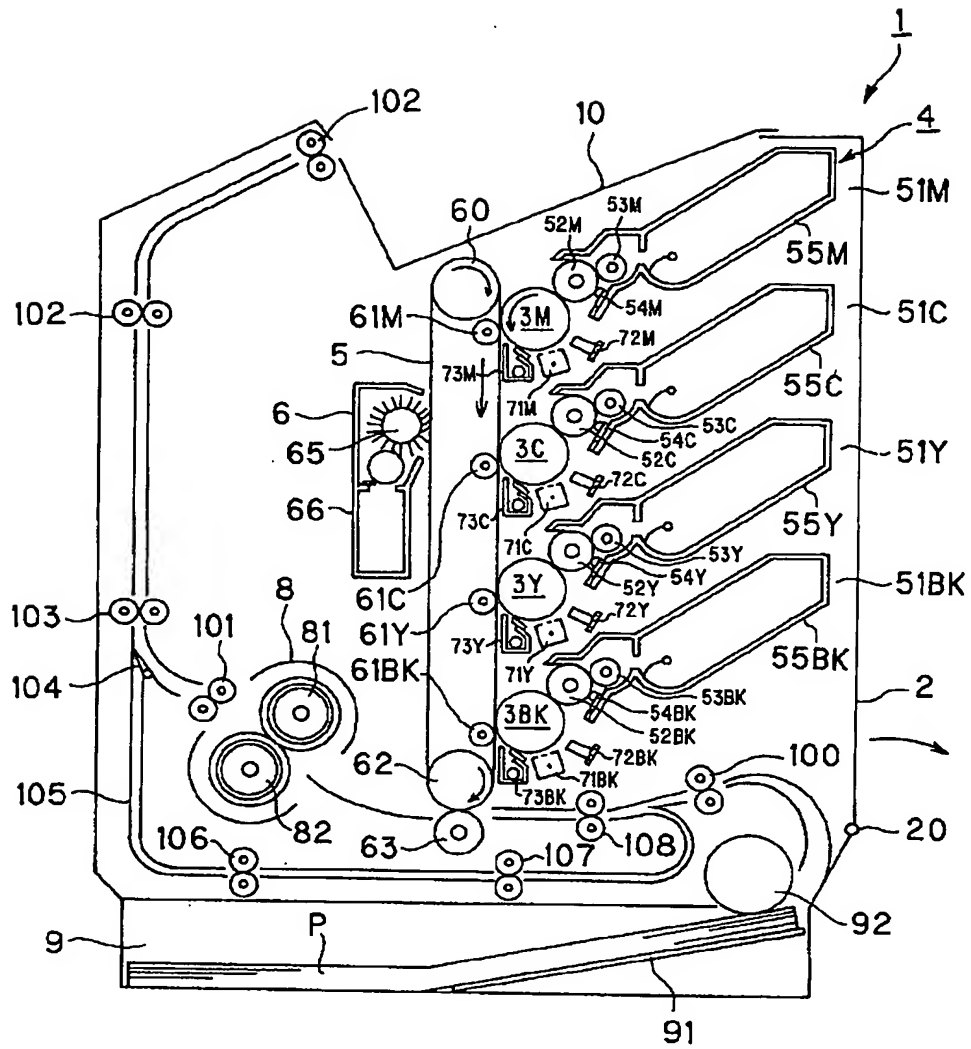
(12)

【図2】



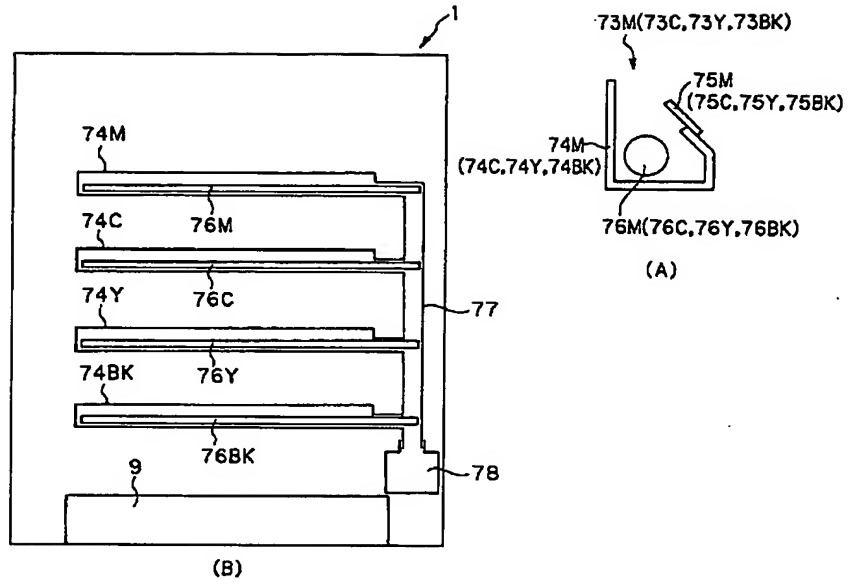
(13)

【図5】



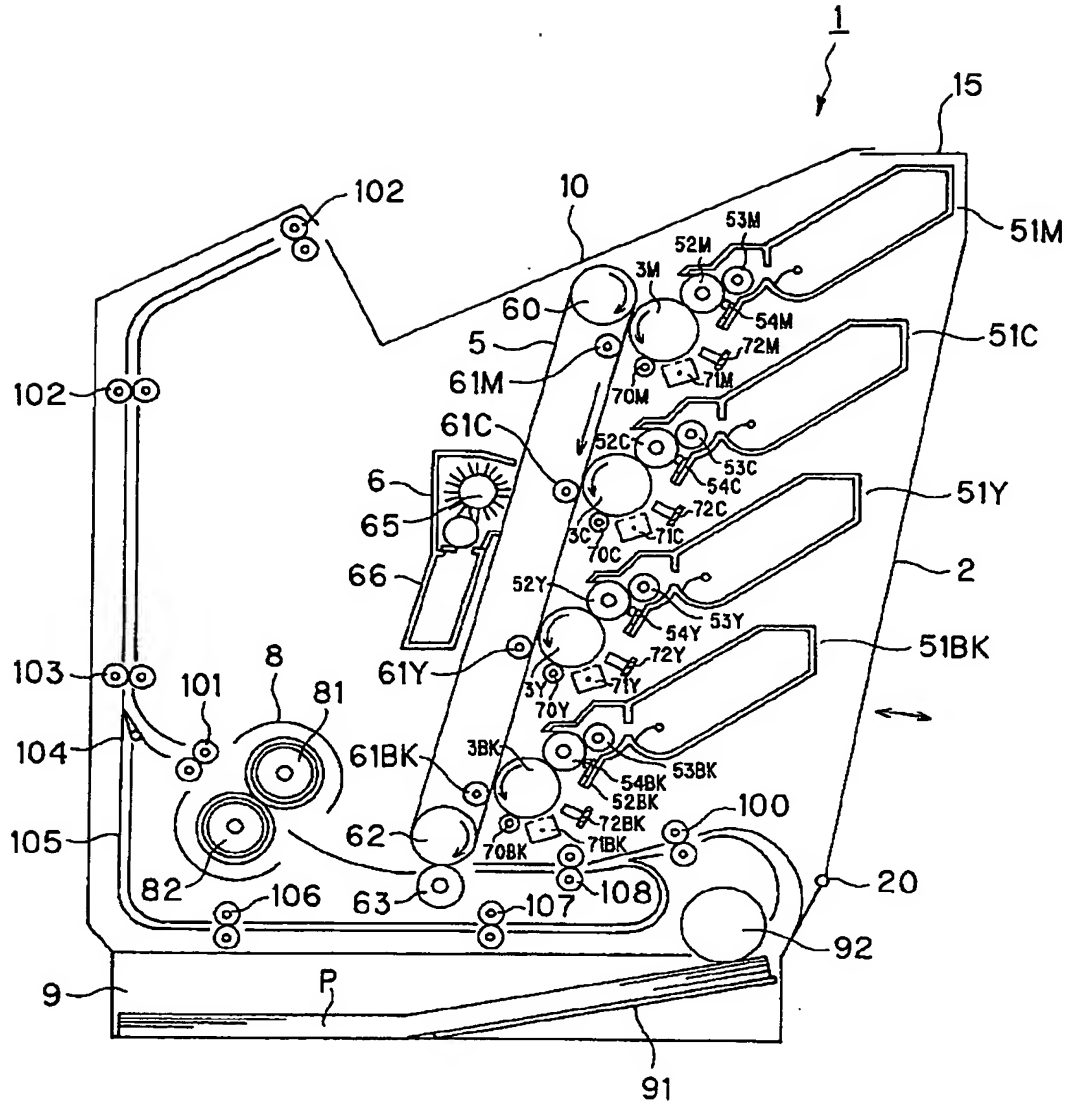
(14)

【図7】



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【図8】



フロントページの続き

(51) Int. Cl. 7

G 0 3 G 21/10
21/00

識別記号

3 7 6

F I

G 0 3 G 15/08
21/00

ターマコード* (参考)

5 0 7 B
3 2 6

F ターム (参考)

2H027 GA03
 2H030 AA01 AA05 AA06 AA07 AB02
 AD03 BB02 BB42
 2H034 CA01
 2H071 AA35 AA48 BA04 BA13 DA03
 DA08 DA09 DA15 EA04 EA18
 2H077 AC16 AD31 BA09 BA10 GA00
 GA13

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-056548

(43)Date of publication of application : 27.02.2001

(51)Int.Cl.

G03F 7/00
B41N 1/14
G03F 7/004
G03F 7/095

(21)Application number : 11-231399

(71)Applicant : FUJI PHOTO FILM CO LTD

(22)Date of filing : 18.08.1999

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KUNIDA KAZUTO

(54) IMAGE FORMING MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a positive type image forming material capable of recording from digital data of a computer or the like using IR emitting solid laser and semiconductor laser and having high sensitivity to IR laser light.

SOLUTION: A 1st layer containing a water-insoluble and alkaline water-soluble polymer and increasing its solubility to an alkali developing solution under the action of light or heat and a 2nd layer containing a compound which generates an acid under the action of light or heat and increasing its solubility to the alkali developing solution by the cleavage of chemical bonds in the presence of the generated acid as a catalyst are successively disposed on a substrate to obtain the objective image forming material.

LEGAL STATUS

[Date of request for examination]

26.08.2004

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

*** NOTICES ***

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CLAIMS

[Claim(s)]

[Claim 1] The 1st layer in which the macromolecule of water-insoluble nature and alkali water solubility is contained on a base material, and the solubility over an alkali developer increases according to an operation of light or heat, The image formation ingredient which comes to prepare the 2nd layer in which the compound which generates an acid according to an operation of light or heat, and the acidolysis nature compound with which the generated acid is made into a catalyst and a chemical bond cleaves are contained, and the solubility over an alkali developer increases by disassembly of an acidolysis nature compound one by one.

[Claim 2] The image formation ingredient according to claim 1 which contains the compound which generates an acid according to an operation of said light or heat, and the acidolysis nature compound with which the generated acid is made into a catalyst and a chemical bond cleaves, and contains an infrared absorption agent further in the 2nd layer in which the solubility over an alkali developer increases by disassembly of an acidolysis nature compound.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the image formation ingredient suitable for the plate for positive type lithography in which the so-called direct platemaking is possible which can carry out direct platemaking using infrared laser from the digital signal of a computer etc. in detail about the image formation ingredient which has sensitivity in an infrared wavelength region.

[0002]

[Description of the Prior Art] As for development of the laser in recent years, **** better **, the solid state laser which emits 1200nm infrared radiation from the wavelength of 760nm especially, and semiconductor laser (it may be hereafter called "infrared laser") can come to hand [high power and a small thing] now easily. Such infrared laser is very useful as the record light source at the time of engraving the direct printing version with digital data, such as a computer. Therefore, to such the infrared record light source, photochemical reaction etc. occurs with a sensitive high image recording ingredient, i.e., an infrared exposure, and requests into the image recording ingredient from which the solubility over a developer changes a lot are mounting in recent years.

[0003] Conventionally, the image formation ingredient which has a sensitization layer containing an acid generator and an acidolysis nature compound as a sensitization layer of the positive type solubilized by the exposure of activity light is known. The constituent with which the photosensitive constituent with which the photosensitive constituent which contains the compound which has an alt.carboxylic acid or a carboxylic amide acetal radical on U.S. Pat. No. 3779779 specifications contains the compound which has an acetal or a ketal radical in a principal chain in JP,53-133429,A contains the compound which has a silyl ether group in JP,60-37549,A again is indicated. However, these have sensibility in ultraviolet rays, by exposure by ultraviolet rays, carry out alkali solubilization, and serve as the non-image section, and image exposure by infrared radiation like cheap and compact semiconductor laser cannot be performed. That is, since energy of infrared radiation was lower than the ultraviolet rays currently used as the conventional light source for exposure, there was a problem that it was difficult to make a compound start photoreaction from which the solubility over the developer of an image recording ingredient changes a lot by infrared exposure.

[0004] On the other hand, with infrared radiation like semiconductor laser, as a technique in which image exposure is possible, on U.S. Pat. No. 5340699 specifications, it has a sensitization layer containing an acid generator, resol resin, novolak resin, and an infrared absorption agent, and the technique used as an image of a negative mold is indicated by heat-treating after image exposure and before a development. With this ingredient, when the above-mentioned heat-treatment was not performed, there was a problem that the image of a positive type was not formed, and also in any, the difficulty that sensibility is low was in the negative mold and the positive type further. In recent years, the acid generator, the acidolysis nature compound, and the image formation ingredient that has a sensitization layer containing an infrared absorption agent are indicated by JP,9-171254,A. In order for an acidolysis nature compound to decompose by this system by making into a catalyst the acid produced by the exposure of activity light and to form a positive type image, Although the big magnification effectiveness is acquired chemically and excelled in the positive operation (development control of the unexposed part is carried out, and it cancels or disappears in the exposure section) which takes place as a result of light-and-heat conversion on the front face of the ingredient by which laser radiation is carried out When the heat generated near the front face did not fully reach to the deep part of an ingredient but it used the common base material made from aluminum, there was a problem of the thermal diffusion near a base material, and the positive operation in a deep part was inadequate. Consequently, even if it carried out alkali development, discrimination of a non-exposed area

and the exposure section could not become clear easily, and improvement in the further sensibility was desired.

[0005]

[Problem(s) to be Solved by the Invention] Using the solid state laser and semiconductor laser which emit infrared radiation, the purpose of this invention can be engraved direct by recording from digital data, such as a computer, and is to offer the image formation ingredient of a high sensitivity positive type to infrared laser.

[0006]

[Means for Solving the Problem] As a result of inquiring wholeheartedly paying attention to the lamination of a positive type image formation ingredient and the property of a surface layer which can emit infrared radiation and can be engraved directly, this invention person etc. is preparing the layer containing the compound of acidolysis nature with which the big magnification effectiveness's is acquired chemically in an image formation ingredient front face, and completed a header and this invention for the ability of the above-mentioned trouble to be solved.

[0007] Namely, the 1st layer in which the image formation ingredient of this invention contains the macromolecule of water-insoluble nature and alkali water solubility on a base material, and the solubility over an alkali developer increases according to an operation of light or heat, The compound which generates an acid according to an operation of light or heat, and the acidolysis nature compound with which the generated acid is made into a catalyst and a chemical bond cleaves are contained, and it is characterized by coming to prepare the 2nd layer in which the solubility over an alkali developer increases by disassembly of an acidolysis nature compound one by one. Here, in the 2nd layer, it is still more desirable from the point of sensibility to contain an infrared absorption agent. In this invention, it is preparing the layer which contains an acidolysis nature compound with high heat utilization effectiveness in the 2nd layer which hits an exposure side, and high sensitivity-ization is attained. Namely, although it has the trouble of being easy to dissolve the interface of the exposure section and a non-exposed area in an alkali developer when the usual positive layer with high alkali developer fusibility used as the 1st layer is used by the monolayer Although solubilize the exposure section by high sensitivity and it is promptly removed, as stated previously, the high positive layer of the alkali developer fusibility which is the 1st layer exposes it and high development nature is shown when this layer is covered with said 2nd layer In a non-exposed area, since said 2nd layer exists, osmosis of the developer to contact to the 1st layer and a developer and the 1st layer can be prevented effectively and a positive layer is protected by stability, it is high sensitivity and the clear image of the image section / non-image section can be obtained. In addition, in this invention, the macromolecule of water-insoluble nature and alkali water solubility is only suitably called an "alkali water-soluble macromolecule." Moreover, the notation "an operation of light or heat" shall include what "is depended on an operation of light and heat, and both sides."

[0008]

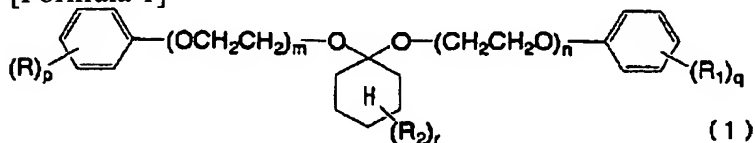
[Embodiment of the Invention] The 1st layer in which the image formation ingredient of this invention contains water-insoluble nature and an alkali water-soluble macromolecule on a base material, and the solubility over an alkali developer increases according to an operation of light or heat hereafter (a positive type sensitization layer is called suitably hereafter), The compound which generates an acid according to an operation of light or heat, and the generated acid are made into a catalyst. The acidolysis nature compound with which a chemical bond cleaves is contained, and it is characterized by coming to prepare the 2nd layer (for a chemistry magnification layer to be called suitably hereafter) in which the solubility over an alkali developer increases by disassembly of an acidolysis nature compound one by one. That what is necessary is to just be prepared in this order, these layers may prepare a layer with still better known surface layer, middle class, back coat layer, etc., unless the effectiveness of this invention is spoiled.

[0009] The [2nd layer [containing the compound which generates an acid according to an operation of light or heat, and the acidolysis nature compound with which the generated acid is made into a catalyst and a chemical bond cleaves] (chemistry magnification layer)] chemistry magnification layer It is desirable to be formed in the exposure side of the maximum upper layer of an image formation ingredient, and let the compound (acid generator) which generates an acid according to an operation of light or heat, and the compound (acidolysis nature compound) with which a chemical bond is cleft by making the generated acid into a catalyst, and the solubility over an alkali developer increases be indispensable components. In a chemistry magnification layer, the high molecular compound which is a binder component for forming this layer may be contained further, and said acidolysis nature compound itself may be the high molecular compound which achieves the function of a binder component, or its precursor.

[0010] [Acidolysis nature compound] In this invention, by making an acid into a catalyst, it can be said to be the compound which has the joint radical which may decompose a chemical bond into intramolecular from an acid with the compound with which it cleaves and the solubility over an alkali developer increases, and can replace with. What was indicated by JP,9-171254,A as "(b) A compound which has at least one decomposition association from an acid" can be used for such a compound. As association which may be decomposed from an acid, a $-(CH_2CH_2O)_n$ -radical (n expresses the integer of 2-5) etc. can be mentioned preferably, for example. It is desirable among such a compound to use the compound expressed with the following general formula (1) from a viewpoint of sensibility and development nature.

[0011]

[Formula 1]



[0012] R, R1, and R2 express a hydrogen atom, the alkyl group of the carbon atomic numbers 1-5, the alkoxy group of the carbon atomic numbers 1-5, a sulfonic group, a carboxyl group, or hydroxyl respectively among [type, p, q, and r express the integer of 1-3 respectively, and m and n express the integer of 1-5 respectively.]

[0013] In said general formula (1), a straight chain or branching is sufficient as the alkyl group which R, R1, and R2 express, for example, a methyl group, an ethyl group, a propyl group, an isopropyl group, butyl, tert-butyl, a pentyl radical, etc. are mentioned, a methoxy group, an ethoxy radical, a propoxy group, an isopropoxy group, a butoxy radical, a tert-butoxy radical, a pentoxy radical, etc. are mentioned as an alkoxy group, for example, and a sulfonic group and a carboxyl group include the salt. Especially the compound whose n is m and 1, or 2 among the compounds expressed with a general formula (1) is desirable. The compound expressed with a general formula (1) is compoundable by the well-known approach.

[0014] in addition, as an acidolysis nature compound which can be applied to this invention JP,48-89603,A, 51-120714, 53-133429, The compound which has C-O-C association of a publication in 55-12995, 55-126236, and 56-17345, The compound which has Si-O-C association of a publication in JP,60-37549,A and 60-121446, The acidolysis compound of others which are indicated by JP,60-3625,A and 60-10247 can be mentioned. The compound which has Si-N association furthermore indicated by JP,62-222246,A, The carbonate indicated by JP,62-251743,A, the orthocarbonic acid ester indicated by JP,62-209451,A, The alt.titanate indicated by JP,62-280841,A, The orthosilicic acid ester indicated by JP,62-280842,A, JP,63-010153,A, JP,9-171254,A, 10-55067, 10-111564, 10-87733, 10-153853, 10-228102, 10-268507, said 282648 numbers, The compound which has C-S association indicated by 10-282670, the acetal indicated by EP-0884547aluminum, ketal and orthocarboxylic ester, and JP,62-244038,A can be used.

[0015] Also especially in the above-mentioned acidolysis nature compound, JP,53-133429,A, 56-17345, 60-121446, 60-37549, 62-209451, 63-010153, JP,9-171254,A, 10-55067, 10-111564, 10-87733, 10-153853, 10-228102, 10-268507, said 282648 numbers, 10-282670, the compound which has C-O-C association indicated by EP0884647aluminum each specification, the compound which has Si-O-C association, orthocarbonic acid ester, acetals, ketals, and silyl ether are desirable. Also in this acidolysis nature compound, it has an acetal or a ketal part repeatedly in a principal chain, and the high molecular compound which goes up with the acid which that solubility generated in the alkali developer is used preferably.

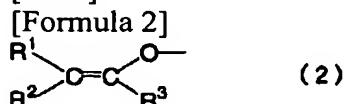
[0016] These acidolysis nature compounds may be used combining two or more sorts, using only one sort. Moreover, as an addition, it is more preferably added in a layer at 15 - 35% of the weight of a rate ten to 50% of the weight five to 70% of the weight to chemistry magnification layer total solids. When it becomes easy to generate the dirt of the non-image section when an addition is less than 5 % of the weight, and an addition exceeds 70 % of the weight, the film reinforcement of the image section becomes inadequate and neither is desirable.

[0017] Moreover, the enol ether mold cross linking agent of a publication can be used for JP,8-220752,A as a precursor of an acidolysis nature compound. This compound is a compound which has at least two enol ether groups as shown in intramolecular by the following general formula (2). This compound, Although the compound which has an enol ether group, and the alkali water-soluble macromolecule which has an acid radical carry out heat bridge formation and an insoluble layer is formed to an alkali developer at the time of heating because form and carry out stoving of the coating liquid containing the alkali water-soluble resin which has an acid radical to general-purpose intramolecular and it carries out the stratification to it By

irradiating [this] laser light at the image, it hydrolyzes with the acid which only the exposure section generated, and becomes meltable to an alkali developer.

[0018]

[Formula 2]



[0019] R1, R2, and R3 express hydrogen, an alkyl group, or an aryl group among a formula, and the same -- or you may differ. Moreover, two of them may join together and the ring of saturation or olefin nature partial saturation may be formed. As a compound which has two or more enol ether groups which can be used for this invention, it is indicated by paragraph number [0030][of above mentioned JP,8-220752,A] - [0051] at the detail. Moreover, the alkali water-soluble giant molecule explained in full detail in the positive type recording layer mentioned later as an alkali water-soluble giant molecule used together with this compound in the stratification can use it suitably. An acidolysis nature compound or its precursor may use only one sort, and may use it combining two or more sorts.

[0020] The compound which has two or more enol ether groups which are the precursors of an acidolysis nature compound is more preferably added in a layer at 5 - 30% of the weight of a rate three to 50% of the weight one to 80% of the weight to chemistry magnification layer total solids. When film reinforcement becomes inadequate when an addition is less than 1 % of the weight and an addition exceeds 80 % of the weight, it becomes easy to generate the dirt of the non-image section, and is not all desirable.

[0021] [Acid generator] The compound (acid generator) which generates an acid with light or heat in this invention points out an infrared exposure and the compound which decomposes with heating of 100 degrees C or more, and generates an acid. As a generated acid, it is desirable that electric dissociation exponents, such as a sulfonic acid and a hydrochloric acid, are two or less strong acid. The acid generated from this acid generator functions as a catalyst, the chemical bond in said acidolysis nature compound cleaves, and this layer becomes meltable at an alkali developer. As an acid generator suitably used in this invention, onium salt, such as iodonium salt, sulfonium salt, phosphonium salt, and diazonium salt, is mentioned. Specifically, the compound indicated by US No. 4,708,925 and JP,7-20629,A can be mentioned. The iodonium salt which uses sulfonic-acid ion as a counter ion especially, sulfonium salt, and diazonium salt are desirable. The diazo resin indicated by a diazonium compound given in U.S. Pat. No. 3,867,147, a diazonium compound given in a U.S. Pat. No. 2,632,703 specification, and each official report of JP,1-102456,A and JP,1-102457,A as diazonium salt is also desirable. Moreover, the benzyl sulfonates indicated by US No. 5,135,838 and US No. 5,200,544 are desirable. Furthermore, the activity sulfonate and disulfo nil compounds which are indicated by JP,2-100054,A, JP,2-100055,A, and Japanese Patent Application No. No. 9444 [eight to] are also desirable. Otherwise, S-triazine which is indicated by JP,7-271029,A and by which halo alkylation was carried out is desirable. Furthermore, in said JP,8-220752,A, the compound indicated as a "acid precursor" or the compound indicated in the JP,9-171254,A number official report as "a compound which may generate an acid by the exposure of (a) activity beam of light" can be applied as an acid generator of this invention.

[0022] These acid generators are more preferably added in a layer at 0.5 - 30% of the weight of a rate 0.1 to 40% of the weight 0.01 to 50% of the weight to chemistry magnification layer total solids. An image is not obtained when an addition is less than 0.01 % of the weight. Moreover, when an addition exceeds 50 % of the weight, dirt is generated in the non-image section at the time of printing.

[0023] These compounds may be used independently and may be used combining two or more sorts. In addition, since UV irradiation can also decompose the acid generator mentioned here, image recording is possible for the image recording ingredient of this invention not only by infrared radiation but the exposure of ultraviolet rays.

[0024] In the ingredient which constitutes this chemistry magnification layer in the image formation ingredient of this invention, it is desirable from a viewpoint of sensibility to contain an infrared absorption agent.

(an infrared absorption agent) especially although especially no limit be if the infrared absorption agent which can be use for this invention have the operation which generate heat by exposure of infrared laser , it be the point which need to do the positive operation between the configuration units of a giant molecule (development control be carry out , it cancel or disappear in the exposure section , and an unexposed part serve as alkali water solubility) , and be desirable in use what a thing have onium salt mold structure . Specifically, colors, such as cyanine dye and pyrylium salt, can be used suitably.

[0025] As the desirable above-mentioned color, the cyanine dye indicated by JP,58-125246,A, JP,59-84356,A, JP,59-202829,A, JP,60-78787,A, etc., cyanine dye given in British JP,434,875,B, etc. can be mentioned, for example.

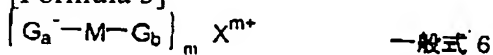
[0026] Moreover, a near-infrared absorption sensitizer given in U.S. Pat. No. 5,156,938 is also used suitably. Furthermore, the arylbenzo(thio)pyrylium salt by which the U.S. Pat. No. 3,881,924 publication was permuted, TORIMECHIN thia pyrylium salt given in JP,57-142645,A (U.S. Pat. No. 4,327,169), JP,58-181051,A, 58-220143, 59-41363, 59-84248, 59-84249, 59-146063, The pyrylium system compound indicated by 59-146061, cyanine dye given in JP,59-216146,A, The pyrylium compound currently indicated by the pentamethine thio pyrylium salt of a publication, etc. JP,5-13514,B, and 5-19702 is also preferably used for U.S. Pat. No. 4,283,475.

[0027] moreover, the near-infrared absorption color indicated by the U.S. Pat. No. 4,756,993 detail in the letter as a formula (I) and (II) can also be mentioned as a desirable color.

[0028] Furthermore, the anionic infrared absorption agent of a publication can also be used [Japanese Patent Application No. / No. 79912 / ten to] suitably. An anionic infrared absorption agent does not have cation structure in the mother nucleus of the coloring matter which absorbs infrared radiation substantially, and points out what has anion structure. For example, an anionic (c1) metal complex, anionic (c2) carbon black, an anionic (c3) phthalocyanine, the compound expressed further (c4) with the following general formula 6 are mentioned. The opposite cation of these anionic infrared absorption agents is the cation of the monovalence containing a proton, or the cation of many **.

[0029]

[Formula 3]



[0030] [Ga- expresses an anionic substituent and Gb expresses a neutral substituent. Xm+ expresses the cation of 1 containing a proton - m **, and m expresses the integer of 1 thru/or 6.]

[0031] Here, an anionic (c1) metal complex points out what serves as an anion by the whole central metal and whole ligand of the complex section which absorb light substantially.

[0032] (c2) The carbon black with which anion radicals, such as a sulfonic acid, a carboxylic acid, and a phosphonic acid radical, have combined anionic carbon black as a substituent is mentioned. What is necessary is just to take the means of oxidizing carbon black from a predetermined acid so that it may be indicated by the 12th edition [of a carbon black handbook / third] (the volume for carbon black associations, April 5, 1995, carbon black association issue) page in order to introduce these radicals into carbon black.

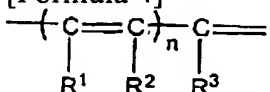
[0033] Although the anionic infrared absorption agent onium salt comes to carry out ionic bond to the anionic radical of this anionic carbon black as an opposite cation is used suitable for this invention, the adsorbate by which onium salt stuck to carbon black is not included by the anionic infrared absorption agent suitably used in this invention, and the effectiveness of this invention is not acquired in the mere adsorbate.

[0034] (c3) The anion radical mentioned to the phthalocyanine frame in explanation [previously / (c2) / as a substituent] joins together, and an anionic phthalocyanine points out what serves as an anion as a whole.

[0035] Next, the compound expressed with the aforementioned (c4) general formula 6 is explained to a detail. M may express a conjugation chain among a general formula 6, and this conjugation chain M may have the substituent and the ring structure. The conjugation chain M can be expressed with the following formula.

[0036]

[Formula 4]



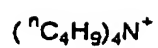
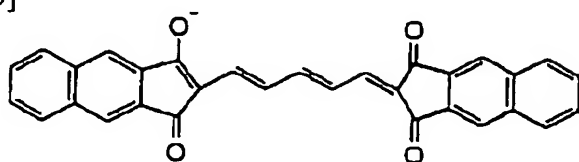
[0037] R1, R2, and R3 express a hydrogen atom, a halogen atom, a cyano group, an alkyl group, an aryl group, an alkenyl radical, an alkynyl group, a carbonyl group, a thio radical, a sulfonyl group, a sulfinyl group, an oxy-radical, and the amino group independently among [type, respectively, and these may be connected mutually and may form the ring structure. n expresses the integer of 1-8.]

[0038] The following things of A-1 to A-19 are preferably used among the anionic infrared absorption agents expressed with the above-mentioned general formula 6.

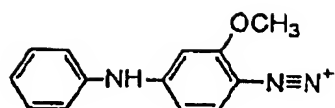
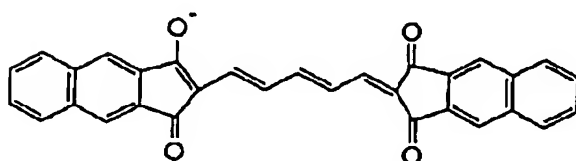
[0039]

[Formula 5]

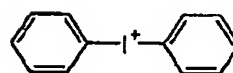
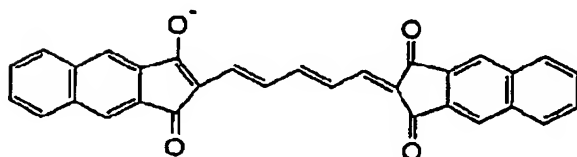
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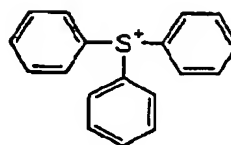
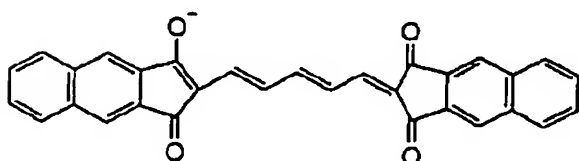
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A-3



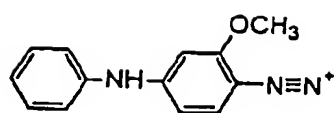
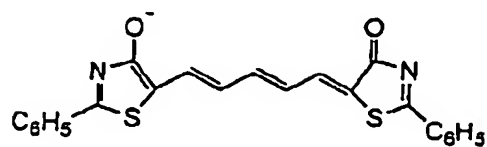
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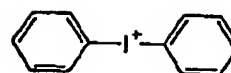
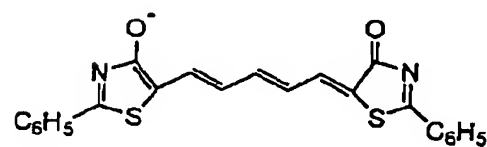
[0040]

[Formula 6]

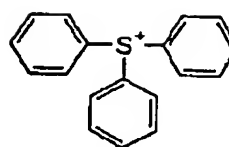
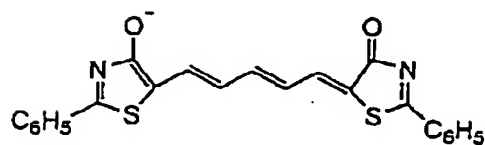
A-5



A-6



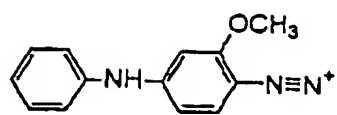
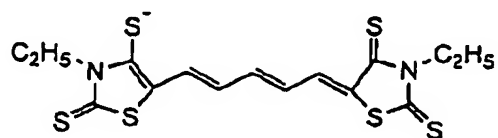
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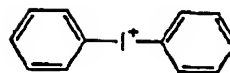
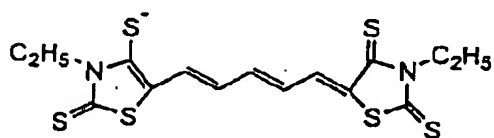
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[Formula 7]

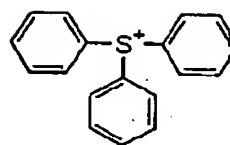
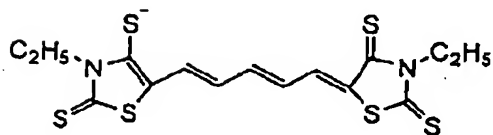
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A-9

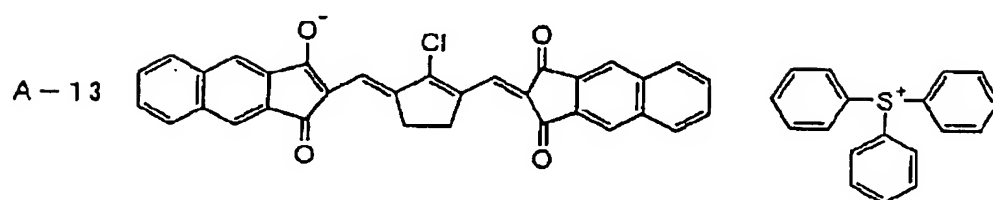
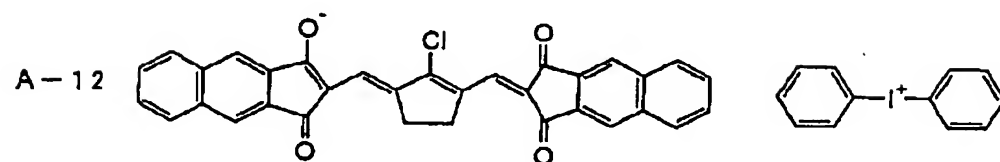
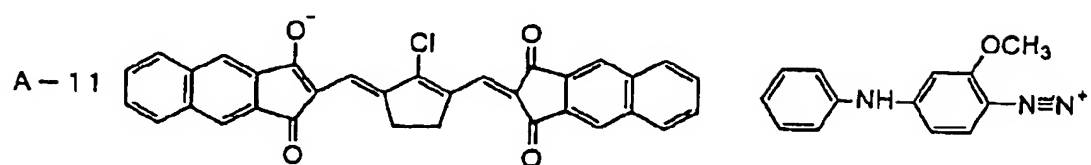


A-10



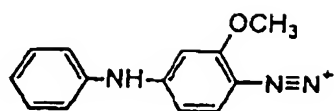
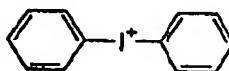
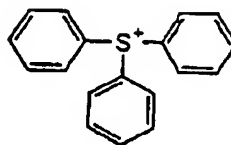
[0042]

[Formula 8]



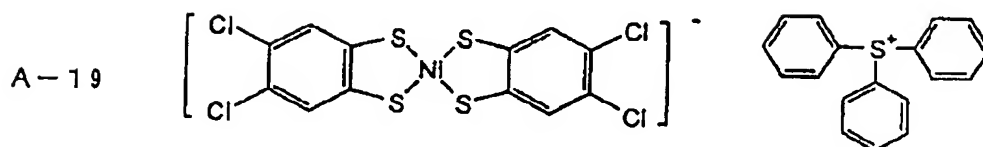
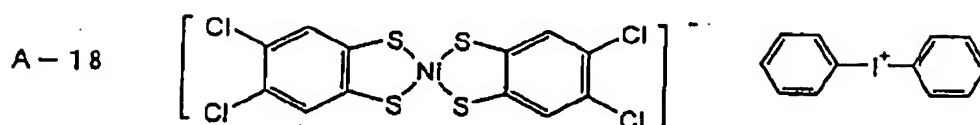
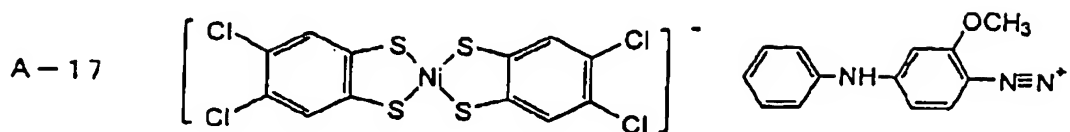
[0043]

[Formula 9]

A-14 carbon-black—CO₂⁻A-15 carbon-black—CO₂⁻A-16 carbon-black—CO₂⁻

[0044]

[Formula 10]

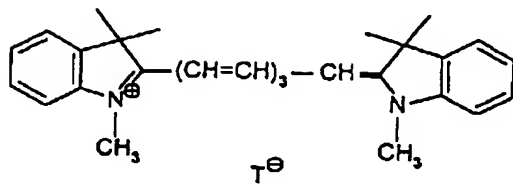


[0045] Moreover, the following are mentioned as an infrared absorption agent which has the onium salt structure which is the suitable example of the infrared absorption agent used for this invention. Although the example (A-20 to A-75) of such an infrared absorption agent is shown, this invention is not restricted to these.

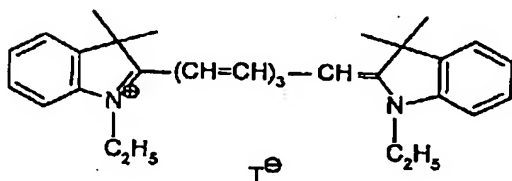
[0046]

[Formula 11]

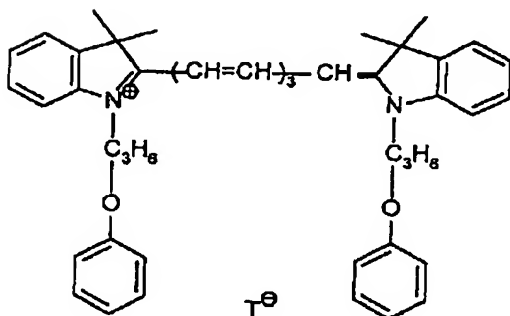
A-20



A-21



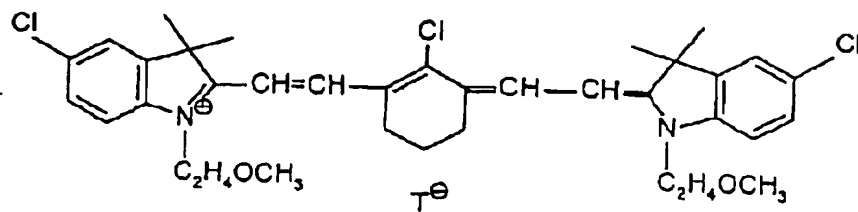
A-22



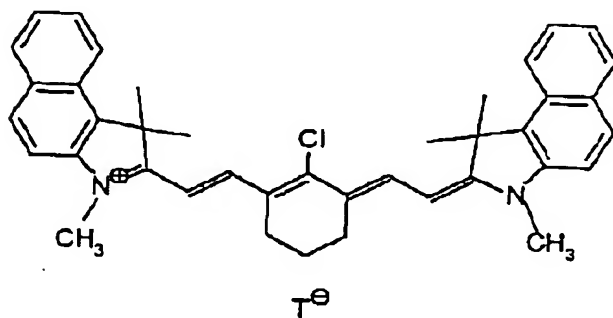
[0047]

[Formula 12]

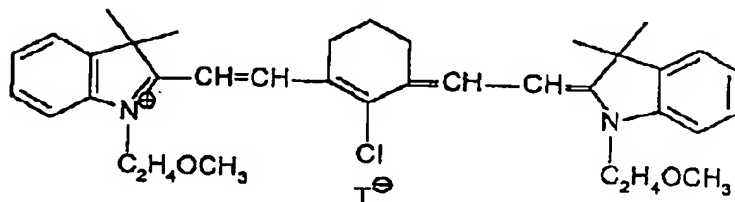
A-23



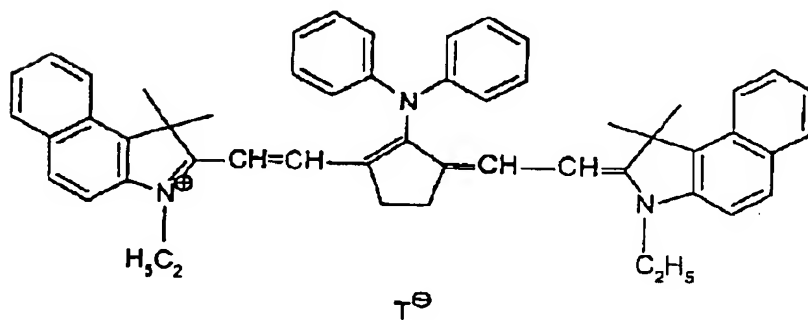
A-24



A-25



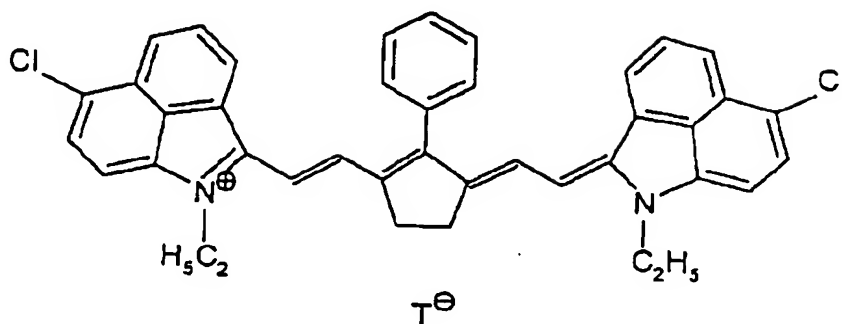
A-26



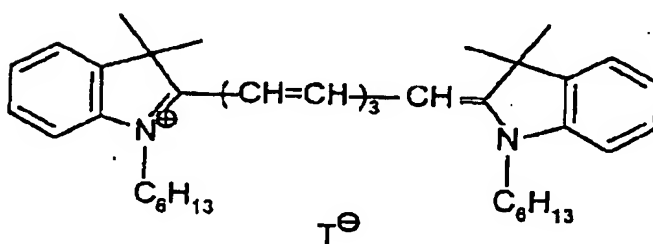
[0048]

[Formula 13]

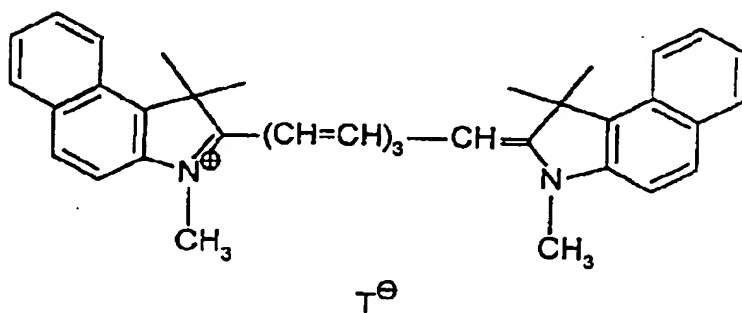
A-27



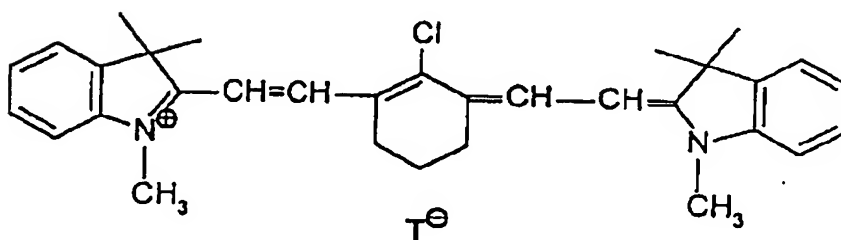
A-28



A-29



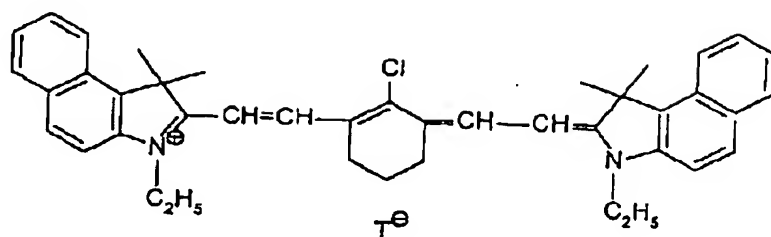
A-30



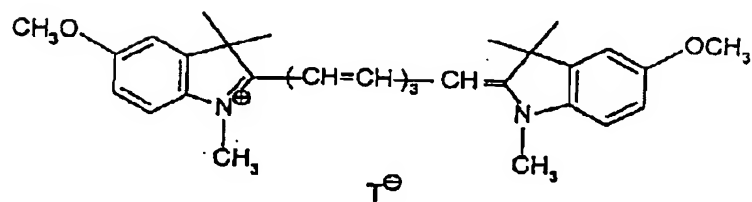
[0049]

[Formula 14]

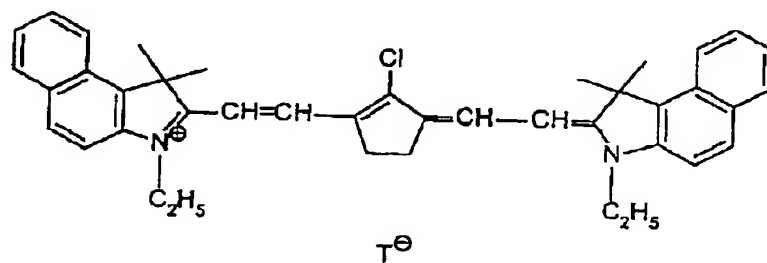
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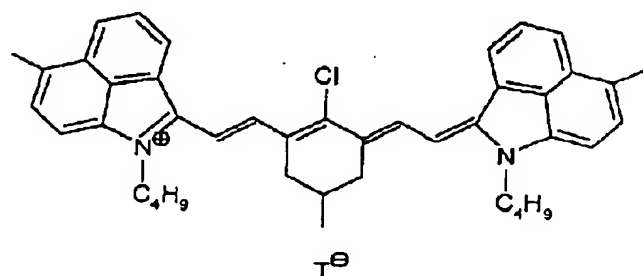
A-32



A-33



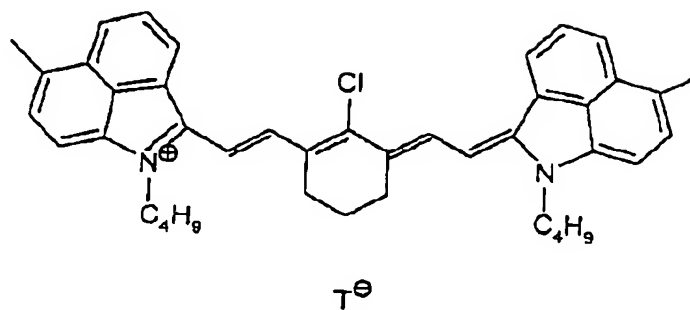
A-34



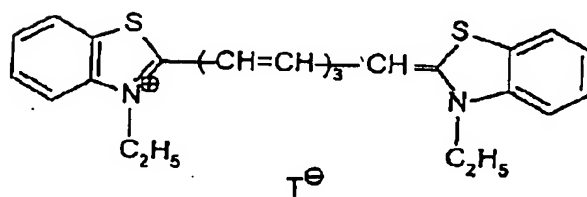
[0050]

[Formula 15]

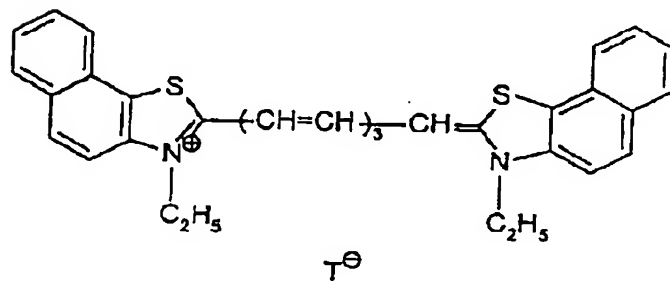
A-35



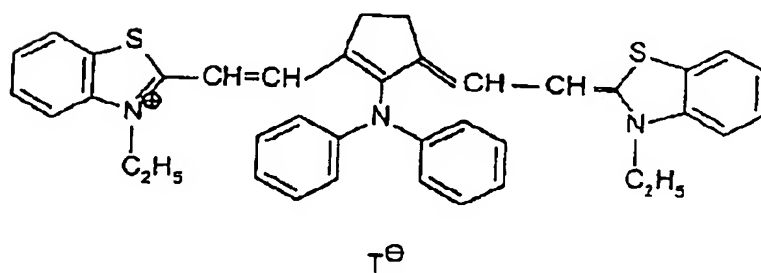
A-36



A-37



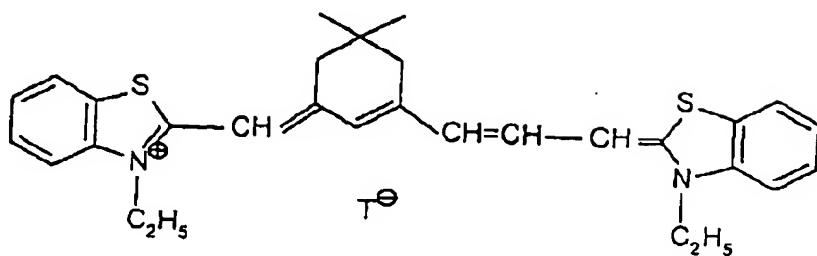
A-38



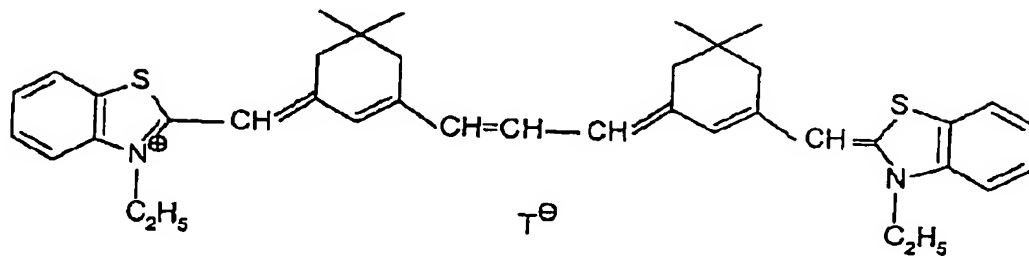
[0051]

[Formula 16]

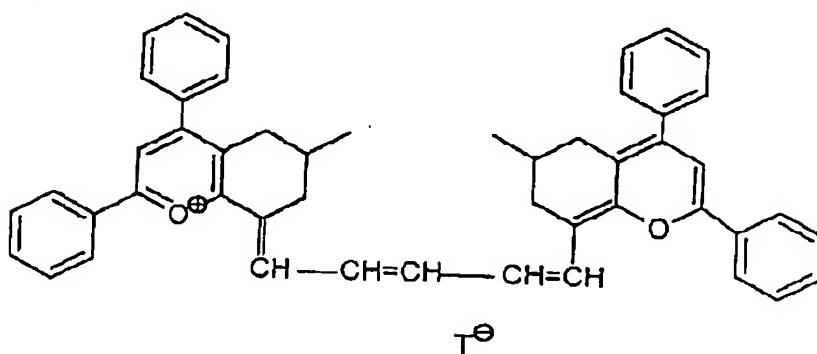
A-39



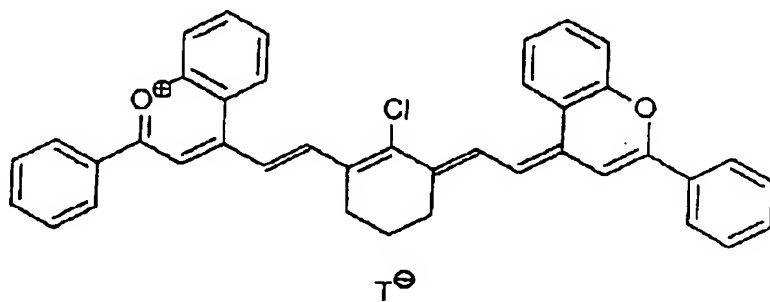
A-40



A-41



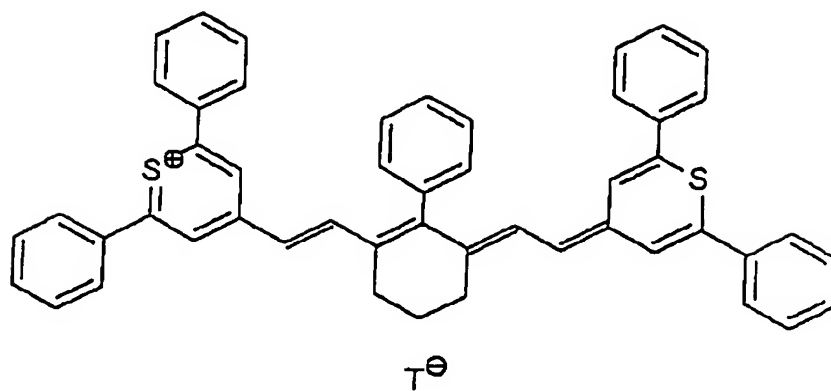
A-42



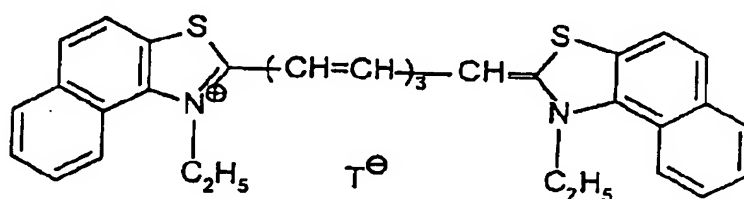
[0052]

[Formula 17]

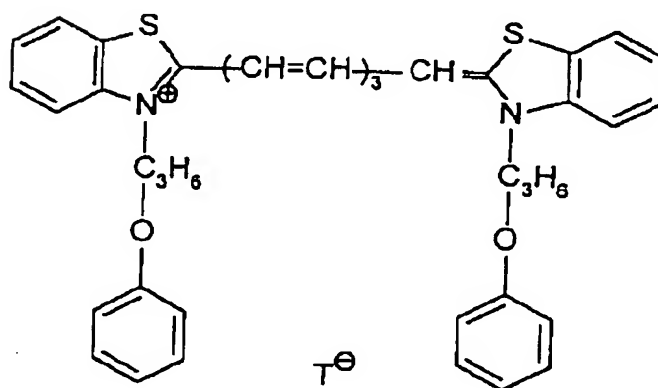
A-43



A-44



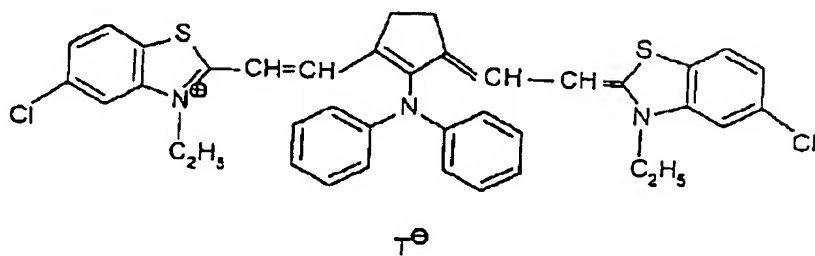
A-45



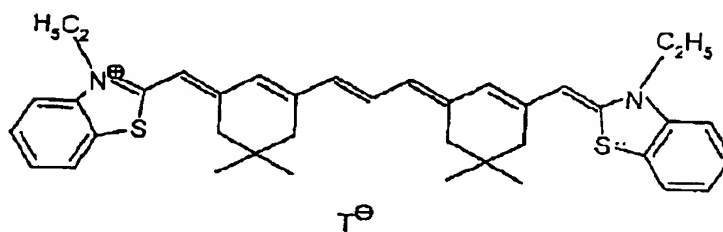
[0053]

[Formula 18]

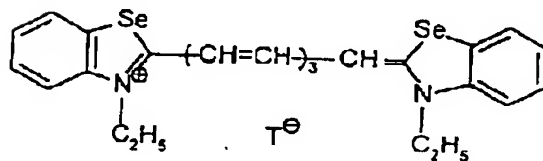
A-46



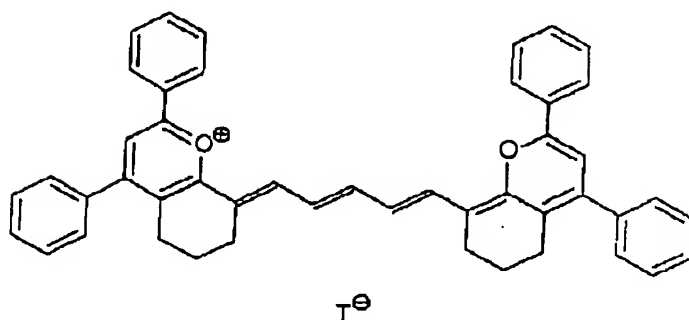
A-47



A-48



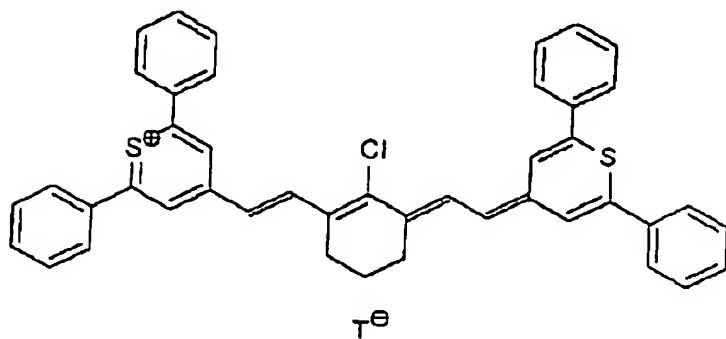
A-49



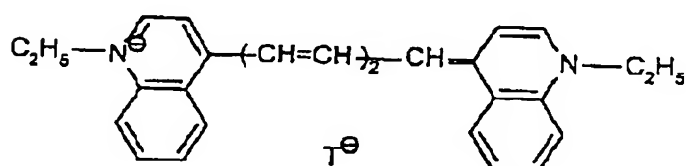
[0054]

[Formula 19]

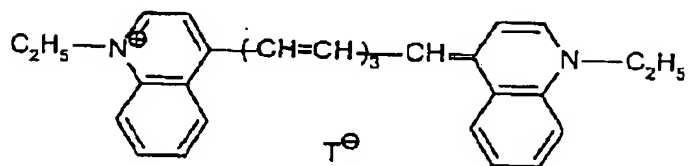
A-50



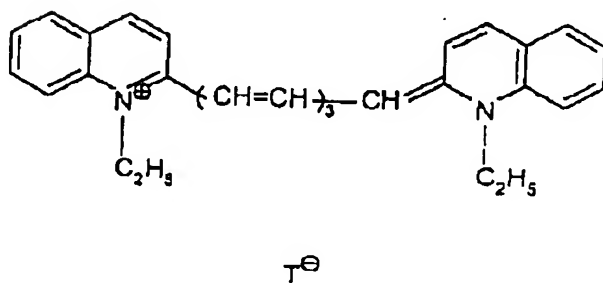
A-51



A-52



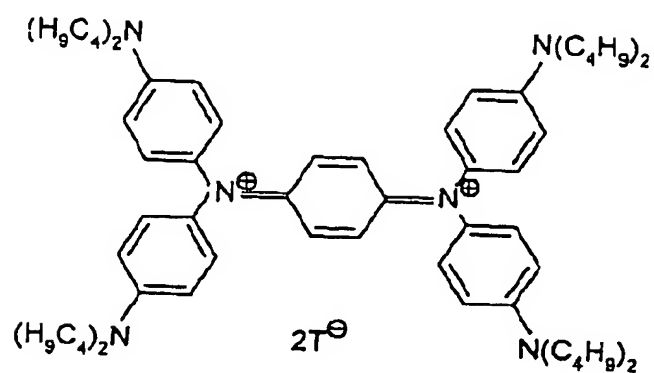
A-53



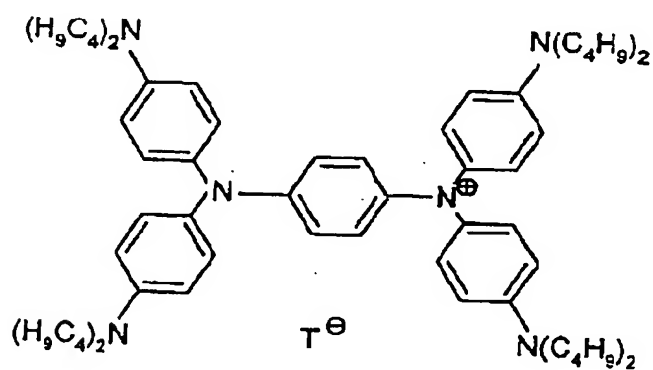
[0055]

[Formula 20]

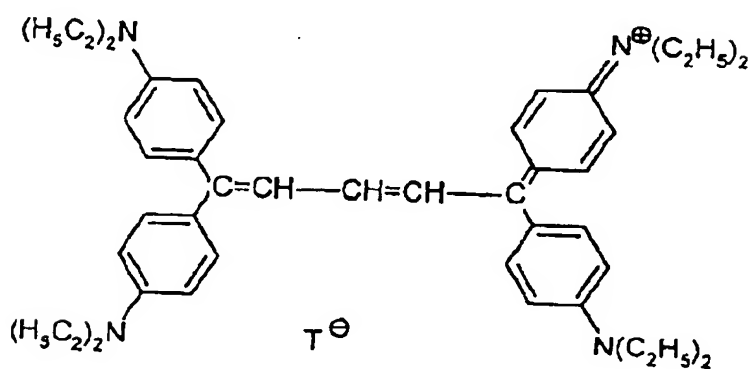
A-54



A-55



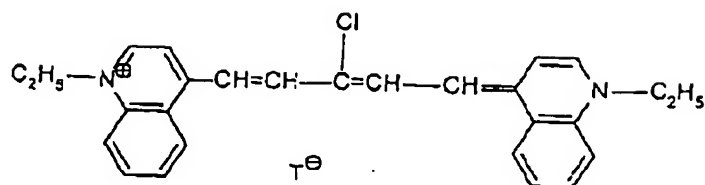
A-56



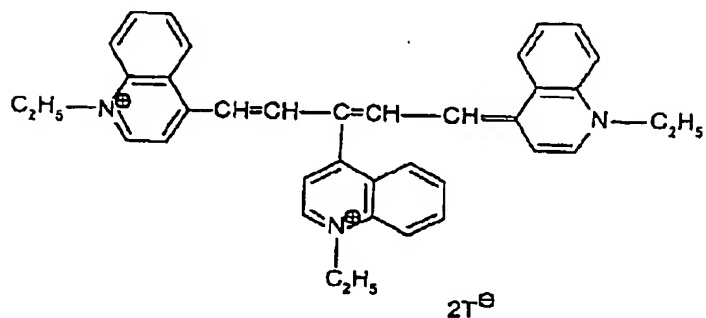
[0056]

[Formula 21]

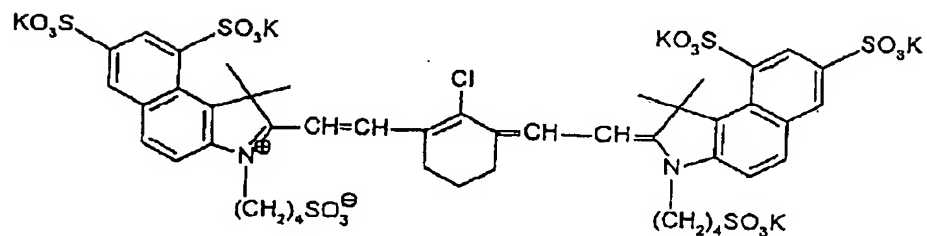
A-57



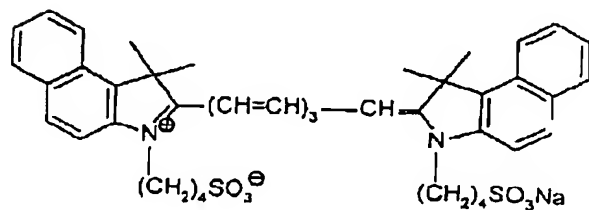
A-58



A-59



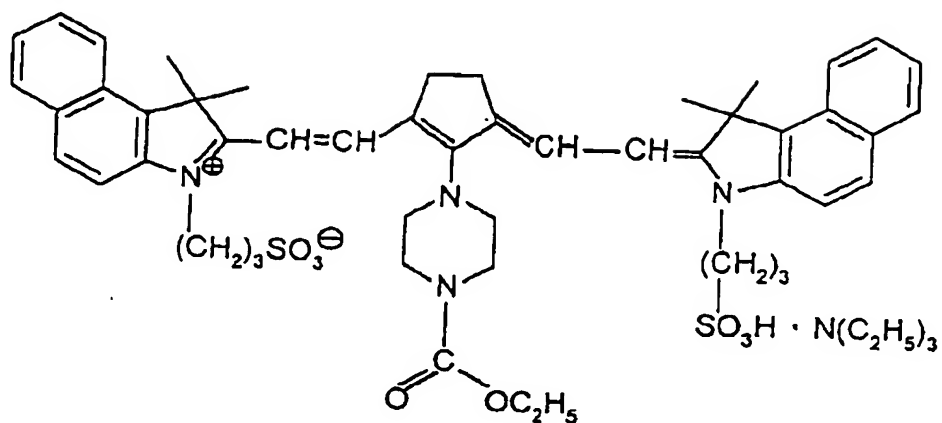
A-60



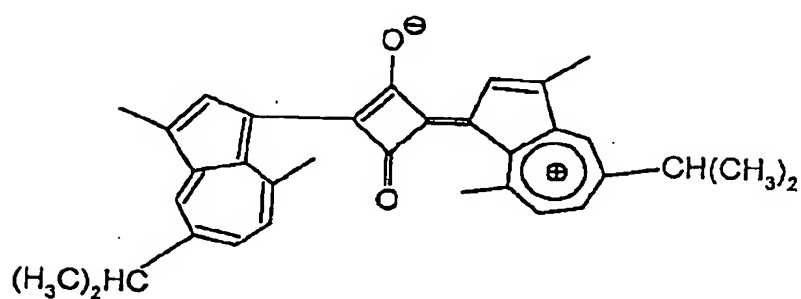
[0057]

[Formula 22]

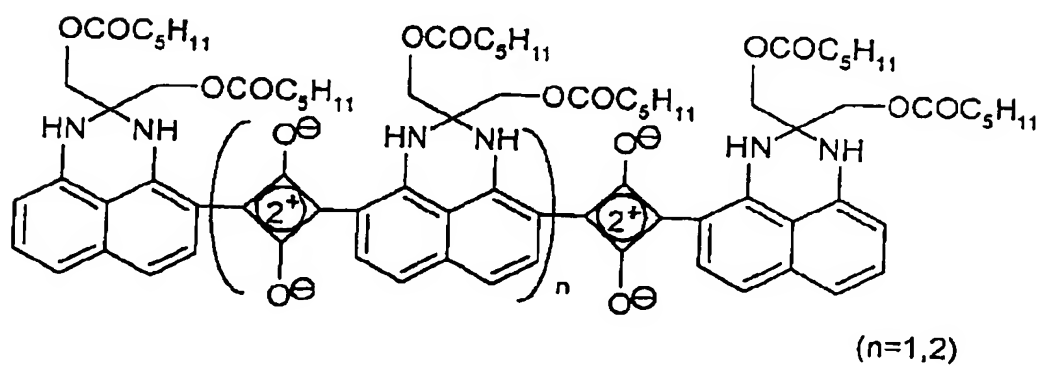
A-61



A-62



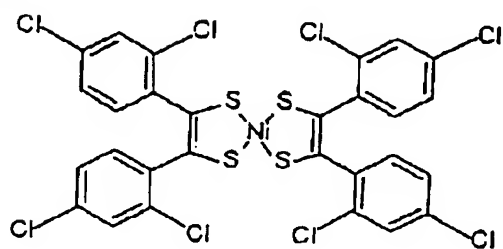
A-63



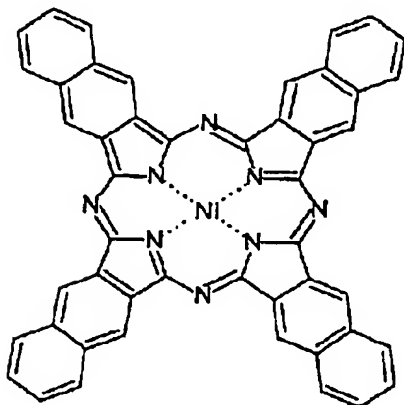
[0058]

[Formula 23]

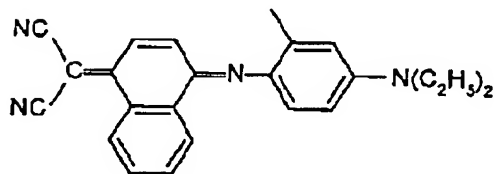
A-64



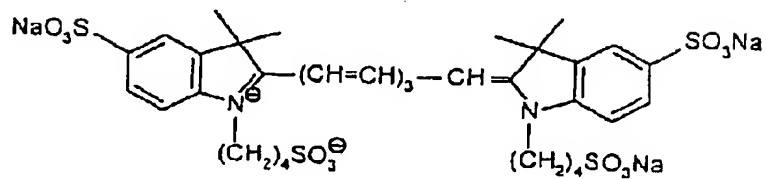
A-65



A-66



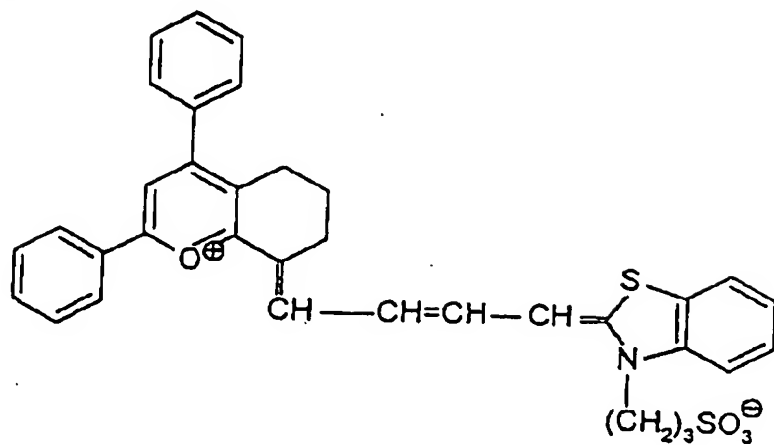
A-67



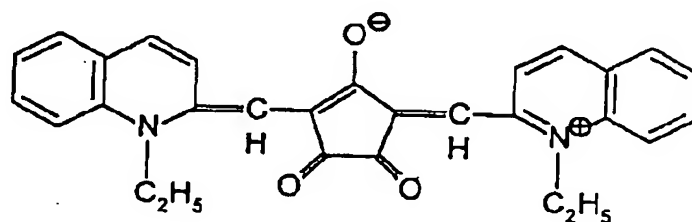
[0059]

[Formula 24]

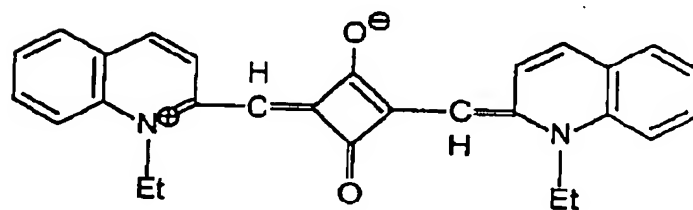
A-68



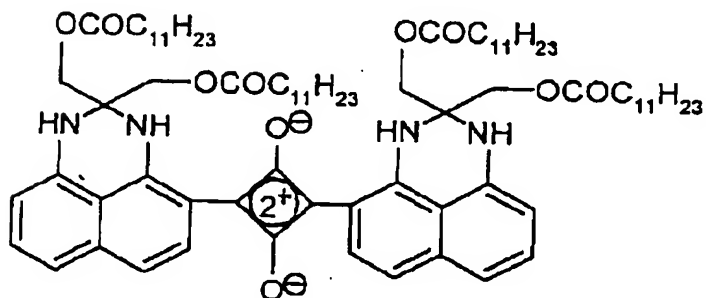
A-69



A-70



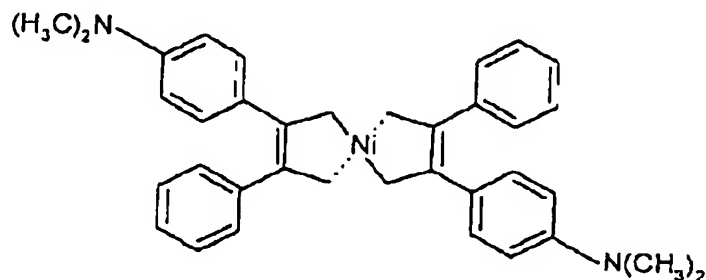
A-71



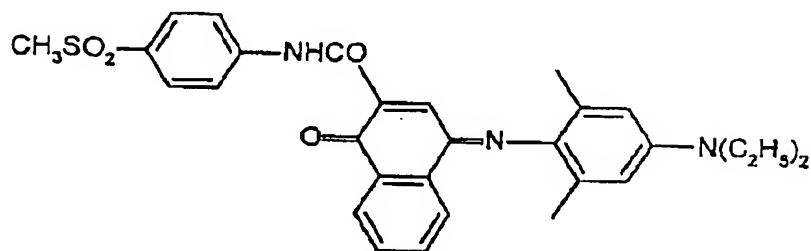
[0060]

[Formula 25]

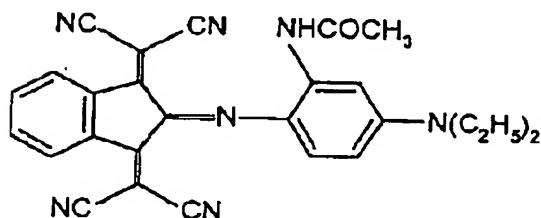
A-72



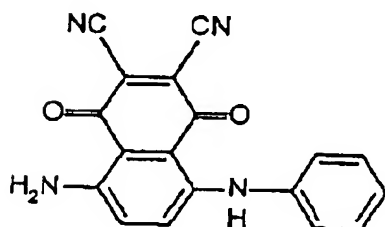
A-73



A-74



A-76



[0061] Among the structure expression of A-20 to A-75, T- expresses a univalent opposite anion and is a halogen anion (F-, Cl-, Br-, I-), a Lewis acid anion (BF₄-, PF₆-, SbCl₆-, ClO₄-), an alkyl sulfonic-acid anion, and an aryl sulfonic-acid anion preferably. As for alkyl here, a carbon atomic number means the shape of a straight chain from 1 to 20, the letter of branching, or an annular alkyl group. Specifically A methyl group, an ethyl group, a propyl group, butyl, a pentyl radical, a hexyl group, A heptyl radical, an octyl radical, a nonyl radical, a decyl group, an undecyl radical, the dodecyl, A tridecyl radical, a hexadecyl radical, an octadecyl radical, a ray KOSHIRU radical, an isopropyl group, An isobutyl radical, s-butyl, t-butyl, an isopentyl radical, a neopentyl radical, 1-methylbutyl radical, an iso hexyl group, a 2-ethylhexyl radical, 2-methyl hexyl group, a cyclohexyl radical, a cyclopentyl group, and 2 1 norbornyl radical can be mentioned. In these, the annular alkyl group to the shape of a straight chain to the carbon atomic numbers 1-12, the letter of branching to the carbon atomic numbers 3-12, and the carbon atomic numbers 5-10 is more desirable. Moreover, aryl here can express that in which the thing, 2, or three benzene ** which consist of the one benzene ring formed the condensed ring, and the thing in which the benzene ring and 5 member partial saturation ring formed the condensed ring, a phenyl group, a naphthyl group, an anthryl radical, a

phenan tolyl group, an indenyl group, an ASEA butenyl group, and a fluorenyl group can be mentioned as an example, and a phenyl group and a naphthyl group are more desirable also in these.

[0062] The color which are these infrared absorption agents can be especially added 0.5 to 10% of the weight preferably 0.1 to 10% of the weight 0.01 to 50% of the weight to total solids in the ingredient which constitutes a chemistry magnification layer. Sensibility becomes it low that the addition of a color is less than 0.01 % of the weight, and if 50 % of the weight is exceeded, dirt will be generated in the non-image section at the time of printing.

[0063] In the image formation ingredient of this invention, the alkali water-soluble macromolecule described below between said chemistry magnification layers and base materials is contained, and it has the 1st layer in which the solubility over an alkali developer increases according to an operation of light or heat. In the positive type recording layer of [1st layer [in which an alkali water-soluble macromolecule is contained and the solubility over an alkali developer increases according to an operation of light or heat] (positive type recording layer)] this invention, the macromolecule (alkali fusibility macromolecule) of water-insoluble nature and alkali water solubility is contained as a binder polymer. With the alkali water-soluble macromolecule in this invention, the homopolymers which contain an acidic group in the principal chain and/or side chain in a macromolecule, these copolymers, or such mixture are included. Therefore, the image formation ingredient of this invention forms the image of a positive type, and development with an alkaline developer is possible for it. What has the acidic group mentioned to following the (1) - (6) in the principal chain of a macromolecule and/or a side chain especially is desirable in respect of the soluble point and dissolution control ability manifestation to an alkaline developer.

[0064] (1) Phenolic group (-Ar-OH)

(2) Sulfonamide radical (-SO₂ NH-R)

(3) Permutation sulfonamide system acid radical (henceforth an "activity imide radical")

[-SO₂ NHCOR, -SO₂ NHSO₂ R, -CONHSO₂ R]

(4) Carboxylic-acid radical (-CO₂ H)

(5) Sulfonic group (-SO₃ H)

(6) Phosphoric-acid radical (-OPO three H₂)

[0065] Ar expresses the divalent aryl connection radical which may have the substituent among above-mentioned (1) - (6), and R expresses the hydrocarbon group which may have the substituent.

[0066] The above (1) The alkali water-soluble macromolecule which has (1) phenolic group, (2) sulfonamide radical, and (3) activity imide radical is desirable also in the alkali water-soluble macromolecule which has the acidic group chosen from - (6), and the alkali water-soluble macromolecule which has (1) phenolic group or (2) sulfonamide radical especially is the most desirable from the point of fully securing the solubility over an alkaline developer, development latitude, and film reinforcement.

[0067] The above (1) As an alkali water-soluble macromolecule which has the acidic group chosen from - (6), the following can be mentioned, for example.

(1) As an alkali water-soluble macromolecule which has a phenolic group For example, the condensation polymerization object of a phenol and formaldehyde, the condensation polymerization object of m-cresol and formaldehyde, The condensation polymerization object of p-cresol and formaldehyde, the condensation polymerization object of m-/p-mixing cresol and formaldehyde, The condensation polymerization object of novolak resin, such as a condensation polymerization object of a phenol, cresol (any of m-, p-, or m-/p-mixing are sufficient), and formaldehyde, and pyrogallol, and an acetone can be mentioned. Furthermore, the copolymer to which copolymerization of the compound which has a phenolic group in a side chain was carried out can also be mentioned. Or the copolymer to which copolymerization of the compound which has a phenolic group in a side chain was carried out can also be used.

[0068] As a compound which has a phenolic group, the acrylamide and methacrylamide which have a phenolic group, acrylic ester, methacrylic ester, or hydroxystyrene is mentioned.

[0069] Specifically N-(2-hydroxyphenyl) acrylamide, N-(3-hydroxyphenyl) acrylamide, N-(4-hydroxyphenyl) acrylamide, N-(2-hydroxyphenyl) methacrylamide, N-(3-hydroxyphenyl) methacrylamide, N-(4-hydroxyphenyl) methacrylamide, o-hydroxyphenyl acrylate, m-hydroxyphenyl acrylate, p-hydroxyphenyl acrylate, o-hydroxyphenyl methacrylate, m-hydroxyphenyl methacrylate, p-hydroxyphenyl methacrylate, o-hydroxystyrene, m-hydroxystyrene, p-hydroxystyrene, 2-(2-hydroxyphenyl) ethyl acrylate, 2-(3-hydroxyphenyl) ethyl acrylate, 2-(4-hydroxyphenyl) ethyl acrylate, 2-(2-hydroxyphenyl) ethyl methacrylate, 2-(3-hydroxyphenyl) ethyl methacrylate, 2-(4-hydroxyphenyl) ethyl methacrylate, etc. are mentioned.

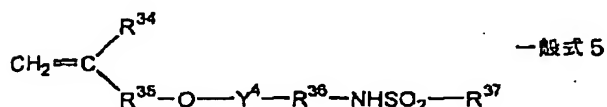
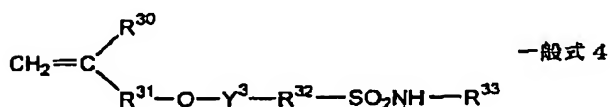
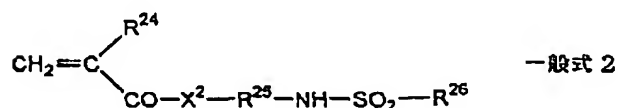
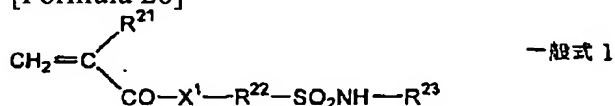
[0070] The weight average molecular weight of an alkali water-soluble macromolecule is 5.0x10² to

2.0x10⁴, and number average molecular weight is 2.0x10² to 1.0x10⁴. A thing is desirable in respect of image formation nature. Moreover, it not only uses these macromolecules independently, but you may use it combining two or more kinds. When combining, the condensation polymerization object of the phenol and formaldehyde which have as substituents an alkyl group of carbon numbers 3-8 like the condensation polymerization object of t-butylphenol and formaldehyde which are indicated by the U.S. Pat. No. 4123279 specification, and the condensation polymerization object of octyl phenol and formaldehyde may be used together.

[0071] (2) The polymer constituted considering the minimum configuration unit which originates in the compound which has a sulfonamide radical as an alkali water-soluble macromolecule which has a sulfonamide radical, for example as a main constituent can be mentioned. The compound which has in intramolecular the sulfonamide radical which at least one hydrogen atom combined with the nitrogen atom, and the partial saturation radical in which a polymerization is possible one or more as above compounds, respectively is mentioned. Especially the low molecular weight compound which has an acryloyl radical, an allyl group or a BINIROKISHI radical, and a permutation, a mono-permutation amino sulfonyl group or a permutation sulfonyl imino group in intramolecular is desirable, for example, the compound expressed with the following general formulas 1-5 is mentioned.

[0072]

[Formula 26]



[0073] X1 and X2 express -O- or -NR27- independently among [type, respectively. R21 and R24 are a hydrogen atom or -CH3 independently, respectively. It expresses. R22, R25, R29, R32, and R36 express the alkylene group, the cyclo alkylene group, arylene radical, or aralkylene group of the carbon numbers 1-12 which may have the substituent independently, respectively. R23, R27, and R33 express the alkyl group, the cycloalkyl radical, aryl group, or aralkyl radical of the carbon numbers 1-12 which may have the hydrogen atom and the substituent independently, respectively. Moreover, R26 and R37 express the alkyl group of the carbon numbers 1-12 which may have the substituent independently, respectively, a cycloalkyl radical, an aryl group, and an aralkyl radical. R28, R30, and R34 are a hydrogen atom or -CH3 independently, respectively. It expresses. R31 and R35 express the alkylene group, the cyclo alkylene group, arylene radical, or aralkylene group of the carbon numbers 1-12 which may have single bond or a substituent independently, respectively. Y3 and Y4 Single bond or -CO- is expressed independently, respectively.]

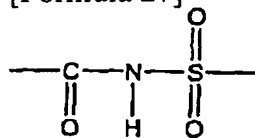
[0074] Especially at the charge of positive type lithography material of this invention, m-aminosulfonylphenylmethacrylate, N-(p-amino sulfonyl phenyl) methacrylamide, N-(p-amino sulfonyl phenyl) acrylamide, etc. can be suitably used among the compounds expressed with general formulas 1-5.

[0075] (3) The polymer constituted considering the minimum configuration unit which originates in the compound which has an activity imide radical as an alkali water-soluble macromolecule which has an

activity imide radical, for example as a main constituent can be mentioned. The compound which has in intramolecular the activity imide radical expressed with the following structure expression and the partial saturation radical in which a polymerization is possible one or more as above compounds, respectively can be mentioned.

[0076]

[Formula 27]



[0077] Specifically, N-(p-tosyl) methacrylamide, N-(p-tosyl) acrylamide, etc. can be used suitably.

[0078] (4) The polymer which makes main constituents the minimum configuration unit originating in the compound which has in intramolecular a carboxylic-acid radical and the partial saturation radical in which a polymerization is possible one or more as an alkali water-soluble giant molecule which has a carboxylic-acid radical, respectively, for example can be mentioned.

(5) The polymer which makes the minimum configuration unit originating in the compound which has in intramolecular a sulfonic group and the partial saturation radical in which a polymerization is possible one or more as an alkali fusibility macromolecule which has a sulfonic group, respectively, for example a main configuration unit can be mentioned.

(6) The polymer which makes main constituents the minimum configuration unit originating in the compound which has in intramolecular a phosphoric-acid radical and the partial saturation radical in which a polymerization is possible one or more as an alkali water-soluble macromolecule which has a phosphoric-acid radical, respectively, for example can be mentioned.

[0079] It is desirable that it is the alkali water-soluble macromolecule which has (1) phenolic hydroxyl group from the point that a strong interaction can be especially obtained between said polyfunctional amine compounds among the above-mentioned alkali water-soluble macromolecules.

[0080] The number especially of the minimum configuration units which constitute the alkali water-soluble macromolecule used for the charge of the positive type lithography version material of this invention and which have the acidic group chosen from aforementioned (1) - (6) does not need to be one, and that to which two or more sort copolymerization of the minimum configuration unit which has two or more sorts or a different acidic group for the minimum configuration unit which has the same acidic group was carried out can also be used for them.

[0081] As the approach of copolymerization, the graft copolymerization method and block which are known conventionally can use heavy lawfulness, a random copolymerization method, etc.

[0082] the compound which has the acidic group as which said copolymer is chosen from (1) - (6) which carries out copolymerization -- the inside of a copolymer -- more than 10 mol % -- what is contained -- desirable -- more than 20 mol % -- what is contained is more desirable. There is an inclination that development latitude cannot fully be raised as it is less than [10 mol %]. In this invention, when a compound is copolymerized and it forms a copolymer, other compounds which do not contain the acidic group of aforementioned (1) - (6) can also be used as the compound. (1) As an example of other compounds which do not contain the acidic group of - (6), the compound mentioned to following (m1) - (m12) can be illustrated.

[0083] (m1) For example, the acrylic ester which has aliphatic series hydroxyl groups, such as 2-hydroxyethyl acrylate or 2-hydroxyethyl methacrylate, and methacrylic ester.

(m2) Alkyl acrylate, such as a methyl acrylate, an ethyl acrylate, acrylic-acid propyl, butyl acrylate, acrylic-acid amyl, acrylic-acid hexyl, acrylic-acid octyl, acrylic-acid benzyl, acrylic-acid-2-chloro ethyl, glycidyl acrylate, and N-dimethylamino ethyl acrylate.

(m3) Alkyl methacrylate, such as a methyl methacrylate, ethyl methacrylate, methacrylic-acid propyl, methacrylic-acid butyl, methacrylic-acid amyl, methacrylic-acid hexyl, cyclohexyl methacrylate, methacrylic-acid benzyl, methacrylic-acid-2-chloro ethyl, glycidyl methacrylate, and N-dimethylaminoethyl methacrylate.

[0084] (m4) Acrylamide or methacrylamide, such as acrylamide, methacrylamide, N-methylol acrylamide, N-ethyl acrylamide, N-hexyl methacrylamide, N-cyclohexyl acrylamide, N-hydroxyethyl acrylamide, N-phenyl acrylamide, N-nitrophenyl acrylamide, and N-ethyl-N-phenyl acrylamide.

(m5) Vinyl ether, such as ethyl vinyl ether, 2-chloro ethyl vinyl ether, hydroxyethyl vinyl ether, propyl vinyl

ether, butyl vinyl ether, octyl vinyl ether, and phenyl vinyl ether

(m6) Vinyl ester, such as vinyl acetate, vinyl chloro acetate, vinyl butyrate, and benzoic-acid vinyl

[0085] (m7) Styrene, such as styrene, alpha methyl styrene, methyl styrene, and chloro methyl styrene

(m8) Vinyl ketones, such as a methyl vinyl ketone, an ethyl vinyl ketone, a propyl vinyl ketone, and a phenyl vinyl ketone

(m9) Olefins, such as ethylene, a propylene, an isobutylene, a butadiene, and an isoprene

[0086] (m10) N-vinyl pyrrolidone, N-vinylcarbazole, 4-vinylpyridine, acrylonitrile, a methacrylonitrile, etc.

(m11) Partial saturation imide, such as maleimide, N-acryloyl acrylamide, N-acetyl methacrylamide, N-propionyl methacrylamide, and N-(p-chloro benzoyl) methacrylamide.

(m12) Unsaturated carboxylic acid, such as an acrylic acid, a methacrylic acid, a maleic anhydride, and an itaconic acid.

[0087] As an alkali water-soluble macromolecule used for the image formation ingredient of this invention, it is not concerned according to a homopolymer and a copolymer, but weight average molecular weight is 1.0×10^3 to 2.0×10^5 , and number average molecular weight is 5.0×10^2 to 1.0×10^5 . The thing in the range is desirable in respect of sensibility and development latitude, and the thing of 1.1-10 has desirable polydispersed degree (weight average molecular weight/number average molecular weight).

[0088] The minimum configuration unit which originates in the compound which has the acidic group chosen from aforementioned (1) - (6) which constitutes the principal chain and/or side chain when using a copolymer in this invention, As for the combination weight ratio of other minimum configuration units and ** which constitutes the part and/or side chain of a principal chain and which does not contain the acidic group of (1) - (6), what is in the range of 50:50-5:95 from a viewpoint of development latitude is desirable, and its thing in the range of 40:60-10:90 is more desirable.

[0089] Among the total solids of the ingredient which may use only one kind, respectively, may use it combining two or more kinds, and constitutes the recording layer in an image formation ingredient, it is desirable to use in 30 - 99% of the weight of the range, as for said alkali water-soluble macromolecule, it is more desirable to use in 40 - 95% of the weight of the range, and especially its thing to use in further 50 - 90% of the weight of the range is desirable. When it is in the inclination for the endurance of a recording layer to get worse when the amount of the above used of an alkali water-soluble macromolecule is less than 30 % of the weight and exceeds 99 % of the weight, since there is an inclination for sensibility and endurance to fall, it is not desirable respectively.

[0090] As a solvent which can be used in the case of composition of the alkali water-soluble macromolecule used by this invention For example, a tetrahydrofuran, ethylene dichloride, a cyclohexanone, A methyl ethyl ketone, an acetone, a methanol, ethanol, ethylene glycol monomethyl ether, Ethylene glycol monoethyl ether, 2-methoxy ethyl acetate, Diethylene-glycol wood ether, 1-methoxy-2-propanol, 1-methoxy-2-propyl acetate, N,N-dimethylformamide, N,N-dimethylacetamide, toluene, ethyl acetate, methyl lactate, ethyl lactate, dimethyl sulfoxide, water, etc. are mentioned. These solvents are independent, or two or more sorts can be mixed and they can be used.

[0091] it be the point that contain an infrared absorption agent need to do the positive [it be desirable and] - especially operation between the configuration units of a giant molecule (development control be carry out , it cancel or disappear in the exposure section , and an unexposed part serve as alkali water solubility) from the viewpoint of sensibility , and it be desirable in the positive type recording layer in the image formation ingredient of this invention to use what a thing have onium salt mold structure . Here, what was previously illustrated in explanation of a chemistry magnification layer can use suitably the infrared absorption agent which can be used.

[0092] The addition to the ingredient total solids which constitute the positive type recording layer of an infrared absorption agent has 0.01 - 50 desirable % of the weight, and its further 0.1 - 10 % of the weight is desirable. If the improvement effectiveness in sensibility is not enough in the addition of a pigment being less than 0.01 % of the weight and 50 % of the weight is exceeded, dirt will be generated in the non-image section at the time of printing, or there is a possibility of becoming the cause of blemish generating.

[0093] Into the ingredient which constitutes the chemistry magnification layer or positive type recording layer in an image formation ingredient of this invention, other colors, a pigment, etc. can also be contained in order to raise sensibility and development latitude further. As other colors, the well-known thing indicated by reference, such as a commercial color and a "color handbook" (the Society of Synthetic Organic Chemistry, Japan edit, Showa 45 annual publications), can be used. Specifically, colors, such as azo dye, metallic complex azo dye, pyrazolone azo dye, a naphthoquinone color, anthraquinone dye, phthalocyanine dye, a carbonium color, a quinonimine dye, methine dye, a gene MONIUMU color, an

aminium color, SUKUWARIRIUMU coloring matter, and a metal thio rate complex, are mentioned. [0094] Moreover, as other pigments, the pigment indicated by a commercial pigment and a Color Index (C. I.) handbook, the "newest pigment handbook" (volume for Japanese pigment American Institute of Technology, 1977 annual publications), the "newest pigment applied technology" (CMC publication, 1986 annual publications), "printing ink technical" CMC publication, and 1984 annual publications can be used. For example, as a class of pigment, a black pigment, a yellow pigment, an orange pigment, brown pigments, red pigments, a purple pigment, a blue pigment, green pigments, a fluorescent pigment, a metallic flake pigment, and other polymer joint coloring matter are mentioned. Specifically, insoluble azo pigment, an azo lake pigment, a disazo condensation pigment, a chelate azo pigment, phthalocyanine pigment, an anthraquinone system pigment, perylene and a peri non system pigment, a thioindigo system pigment, the Quinacridone system pigment, a dioxazine system pigment, an isoindolinone system pigment, a kino FUTARON system pigment, a blue-and-white porcelain lake pigment, an azine pigment, a nitroso pigment, a nitro pigment, a natural pigment, a fluorescent pigment, an inorganic pigment, carbon black, etc. can be used. A desirable thing is carbon black among these pigments.

[0095] These pigments may be used without carrying out surface treatment, may perform surface treatment and may be used. In the approach of surface treatment, the approach of carrying out the surface coat of resin or the wax, the approach to which a surfactant is made to adhere, the method of combining the active substance (for example, a silane coupling agent, an epoxy compound, poly isocyanate, etc.) with a pigment front face, etc. can be considered. The above-mentioned surface treatment approach is indicated by "the property of metallic soap, application" (Saiwai Shobo), the "printing ink technique" (CMC publication, 1984 annual publications), and the "newest pigment applied technology" (CMC publication, 1986 annual publications).

[0096] As for the particle size of a pigment, it is desirable that it is in the range of 0.01 micrometers - 10 micrometers, it is still more desirable that it is in the range which is 0.05 micrometers - 1 micrometer, and it is desirable that it is in the range of 0.1 micrometers - 1 micrometer especially. When the particle size of a pigment is less than 0.01 micrometers, it is not desirable in respect of the stability in the inside of the image recording layer coating liquid of a distributed object, and if 10 micrometers is exceeded, it is not desirable in respect of the homogeneity of an image recording layer.

[0097] As an approach of distributing a pigment, the well-known distributed technique used for ink manufacture, toner manufacture, etc. can be used. As a disperser, an ultrasonic distribution machine, a sand mill, attritor, a pearl mill, a super mill, a ball mill, an impeller, DESUPAZA, KD mill, a colloid mill, a dynatron, 3 roll mills, a pressurized kneader, etc. are mentioned. For details, it is indicated by the "newest pigment applied technology" (CMC publication, 1986 annual publications).

[0098] The addition to the ingredient total solids which constitute the chemistry magnification layer / positive type recording layer in the image formation ingredient of these pigments has 0.01 - 50 desirable % of the weight, and its further 0.1 - 10 % of the weight is desirable. If the improvement effectiveness in sensibility is not enough in the addition of a pigment being less than 0.01 % of the weight and 50 % of the weight is exceeded, dirt will be generated in the non-image section at the time of printing, or there is a possibility of becoming the cause of blemish generating.

[0099] You may add in the same layer as other components, and these colors or pigments may prepare another layer, and may add it there. Moreover, especially the thing that absorbs infrared light or near-infrared light is desirable also in the above-mentioned color or a pigment. Moreover, a color and two or more sorts of pigments may be used together.

[0100] Various additives can be added into the ingredient which constitutes the chemistry magnification layer / positive type recording layer in the image formation ingredient of this invention. For example, to a recording layer, it is desirable to contain a polyfunctional amine compound. By making it **** with said alkali water-soluble macromolecule, this polyfunctional amine compound interacts with the alkali fusibility radical in this macromolecule strongly, and has the operation (cross-linking operation) which stabilizes the membrane structure of a recording layer. As for such a polyfunctional amine compound, the number of functional groups says the thing of at least two or more amine compounds. Since a cross-linking operation does not arise that the number of functional groups is one, the effectiveness of addition is not acquired. Since it can form a firmer network that it is three or more as a minimum of the number of functional groups, it is desirable, and it is desirable that it is ten or less in order not to form the insoluble complex by the viewpoint of manufacture fitness and the firm interaction between polyfunctional radicals as an upper limit of the number of functional groups, and it is six or less more preferably.

[0101] As for the polyfunctional amine compound as an additive, it is desirable that it is water solubility or

water-dispersion. It should excel in development nature at the time of the thing which has water-dispersion [of neutral extent / sufficient with water / the so-called water solubility or water-dispersion / so-called], then the below-mentioned alkali development, without the developer's having fully permeated to the interior of the charge of lithography material, and spoiling the discrimination of an image. In addition, it is desirable that 0.5g /or more dissolves l. to water as "water-soluble" capacity in this invention. Moreover, it is desirable that 0.5g /or more distributes l. to water as "water-dispersion" capacity.

[0102] As for the polyfunctional amine compound used for this invention, it is more desirable than the viewpoint of development nature not to have onium structure. As a polyfunctional amine compound used suitable for this invention, the compound which added the amine compound to the commercial polyfunctional polymerization nature monomer is mentioned. The polyfunctional amine compound used for this invention may be used by the one-kind independent, or two or more sorts may be mixed and used for it.

[0103] When adding a polyfunctional amine compound to a recording layer in this invention, it is desirable to consider as 3 % of the weight - 50% of the weight of the range to said alkali water-soluble macromolecule as the addition, and it is 10 % of the weight - 20% of the weight of the range more preferably. Since spreading fitness and coat nature will fall if it, on the other hand, exceeds 50 % of the weight preferably, since the effectiveness of this invention is not fully demonstrated as it is less than 3 % of the weight, it is not desirable.

[0104] Moreover, since other onium salt, an aromatic series sulfone compound, an aromatic series sulfonate compound, etc. act as pyrolysis nature matter, if such matter is added for example, since the lysis inhibition nature to the developer of the image section can be raised, it is desirable.

[0105] As the above-mentioned onium salt, diazonium salt, ammonium salt, phosphonium salt, iodonium salt, sulfonium salt, a seleno NIUMU salt, arsonium salt, etc. can be mentioned. As a thing suitable as onium salt used in this invention For example, S.I.Schlesinger, Photogr.Sci.Eng., 18,387 (1974), T. S.Bal et al, Polymer21,423 (1980), Or diazonium salt given in JP,5-158230,A, U.S. Pat. No. 4,069,055, Said 4,069,056 numbers or ammonium salt given in JP,3-140140,A, D.C.Necker et 17 al, Macromolecules, 2468 (1984), C. S.Wen et al, Teh, Proc.Conf.Rad.Curing Phosphonium salt given in ASIA, p478Tokyo, Oct (1988), U.S. Pat. No. 4,069,055, or said 4,069,056 numbers, [0106] J. V.Crivello et al, Macromolecules10 (6), 1307 (1977) Chem.& Eng.News, Nov.28, p31 (1988), The Europe patent No. 104,143, U.S. Pat. No. 339,049, 410,201, Iodonium salt given in JP,2-150848,A or JP,2-296514,A, J. -- V.Crivelloet al and Polymer J. -- 17 and 73 (1985) -- J. V.Crivello et 43 al.J.Org.Chem., 3055 (1978), W. R.Watt et al, J.Polymer Sci., Polymer 22 Chem.Ed., 1789 (1984), J. V.Crivelloet al, Polymer Bull., 14,279 (1985), J. V.Crivello et al, Macromolecules14 (5), 1141 (1981), J.V.Crivello et al, J.Polymer 17 Sci., PolymerChem.Ed., 2877 (1979), The Europe patent No. 370,693, said 233,567 numbers, said 297,443 numbers, Said 297,442 numbers, U.S. Pat. No. 4,933,377, said 3,902,114 numbers, Said 410,201 numbers, said 339,049 numbers, said 4,760,013 numbers, Said 4,734,444 numbers, said 2,833,827 numbers, Germany patent No. 2,904,626, Sulfonium salt given in said 3,604,580 numbers or said 3,604,581 numbers, J. V.Crivello et al, Macromolecules10 (6), 1307 (1977) or J.V.Crivello et al, J.Polymer Sci., PolymerChem.Ed., a seleno NIUMU salt given in 17 and 1047 (1979), C. S.Wen et al, Teh, Proc.Conf.Rad.Curing ASIA, p478 The arsonium salt of a publication etc. is mentioned to Tokyo and Oct (1988).

[0107] As a counter ion of the above-mentioned onium salt, 4 boric-acid fluoride, a 6 phosphorus-fluoride acid, A triisopropyl naphthalene sulfonic acid, 5-nitro-o-toluenesulfonic acid, 5-sulfosalicylic acid, 2, 5-dimethylbenzene sulfonic acid, 2 and 4, 6-trimethyl benzenesulfonic acid, 2-nitrobenzene sulfonic acid, 3-chlorobenzene sulfonic acid, 3-bromobenzene sulfonic acid, 2-fluoro capryl lactam naphthalene sulfonic acid, dodecylbenzenesulfonic acid, a 1-naphthol-5-sulfonic acid, 2-methoxy-4-hydroxy-5-benzoyl-benzenesulfonic acid, Para toluenesulfonic acid, etc. can be mentioned. Also in these, an alkyl aromatic series sulfonic acid especially like a 6 phosphorus-fluoride acid, a triisopropyl naphthalene sulfonic acid, or 2 and 5-dimethylbenzene sulfonic acid is suitable.

[0108] The addition to the ingredient total solids which constitute the recording layer in the charge of lithography material of onium salt is 10 - 30 % of the weight especially preferably five to 30% of the weight still more preferably one to 50% of the weight preferably.

[0109] Moreover, the color which has big absorption in a light region can be used as a coloring agent of an image. An oil color and basic dye can be mentioned as a suitable color. Specifically Oil yellow #101, oil yellow #103, oil pink #312, the oil green BG Oil blue BOS, oil blue #603, oil black BY, Oil black BS, oil black T-505 (above product made from ORIENT Chemical industry), Victoria pure blue, a crystal violet (CI42555), Methyl Violet (CI42535), ethyl violet, Rhodamine B (CI145170B), Malachite Green (CI42000), methylene-blue (CI52015), and eye ZENSU pyrone blue C-RH (product made from Hodogaya Chemistry)

etc. can mention the color indicated by JP,62-293247,A.

[0110] It is more desirable to add, since distinction of the image section after image formation and the non-image section will become clear, if these colors are added. In addition, 0.01 - 10% of the weight of the range of an addition is desirable to the ingredient total solids which constitute the recording layer in the charge of lithography material.

[0111] Furthermore, cyclic anhydrides, phenols, and organic acids can also be added in order to raise sensibility. As a cyclic anhydride, phthalic anhydride [which is indicated by the U.S. Pat. No. 4,115,128 specification], tetrahydro phthalic anhydride, hexahydro phthalic anhydride, 3, and 6- and oxy--delta4- tetrahydro phthalic anhydride, tetra-KURORU phthalic anhydride, a maleic anhydride, the Krol maleic anhydride, alpha-phenyl maleic anhydride, a succinic anhydride, pyromellitic dianhydride, etc. can be used.

[0112] as phenols -- bisphenol A, p-nitrophenol, a p-ethoxy phenol, 2 and 4, a 4'-trihydroxy benzophenone, 2 and 3, 4-trihydroxy benzophenone, a 4-hydroxy benzophenone, 4, 4', and 4"- trihydroxy triphenylmethane color, 4, 4', 3", 4"- tetra--- hydroxy one - a 3, 5, 3', and 5'-tetramethyl triphenylmethane color etc. is mentioned.

[0113] Are indicated by JP,60-88942,A, JP,2-96755,A, etc. as organic acids. There are sulfonic acids, sulfinic acids, alkyl sulfuric acid, phosphonic acid, phosphoric ester, and carboxylic acids. Specifically P-toluenesulfonic acid, dodecylbenzenesulfonic acid, p-toluene sulfinic acid, Ethyl sulfuric acid, phenylphosphonic acid, phenyl phosphinic acid, phosphoric-acid phenyl, Phosphoric-acid diphenyl, a benzoic acid, isophthalic acid, an adipic acid, para toluylic acid, 3, 4-dimethoxy benzoic acid, a phthalic acid, a terephthalic acid, the 4-cyclohexene -1, 2-dicarboxylic acid, an erucic acid, a lauric acid, an n undecane acid, an ascorbic acid, etc. are mentioned.

[0114] The rate of occupying in the ingredient total solids which constitute the recording layer in the charge of a lithography plate of the above-mentioned cyclic anhydride, phenols, and organic acids has 0.05 - 20 desirable % of the weight, and it is 0.1 - 10 % of the weight especially preferably 0.1 to 15% of the weight more preferably.

[0115] Moreover, into the ingredient which constitutes the recording layer in the charge of lithography material of this invention, since the stability of the processing to development conditions is raised, an amphoteric surface active agent which is indicated by a nonionic surface active agent which is indicated by JP,62-251740,A and JP,3-208514,A, JP,59-121044,A, and JP,4-13149,A can be added.

[0116] As an example of a nonionic surface active agent, sorbitan tristearate, sorbitan monopalmitate, a sorbitan trio rate, a stearin acid monoglyceride, the polyoxyethylene nonylphenyl ether, etc. are mentioned.

[0117] As an example of an amphoteric surface active agent, alkyl di(aminoethyl)glycine, alkylpolyamino ethylglycine hydrochloride, 2-alkyl-N-carboxy ethyl-N-hydroxyethyl-imidazolinium-betaine, N-tetradecyl-N, and N-betaine mold (for example, trade name Amogen K, the product made from the first Industry) etc. is mentioned.

[0118] The rate of occupying in the ingredient total solids which constitute the recording layer in the charge of lithography material of the above-mentioned nonionic surface active agent and an amphoteric surface active agent has 0.05 - 15 desirable % of the weight, and it is 0.1 - 5 % of the weight more preferably.

[0119] Into the ingredient which constitutes the recording layer in the image formation ingredient of this invention, the color and pigment as the baked appearance electuarium and the image coloring agent for obtaining a visible image immediately after heating by exposure can be added. The combination of the compound (photo-oxide emission agent) which emits an acid with heating by exposure as baked appearance electuarium, and the organic dye which can form a salt can be mentioned as a representative. The combination of the trihalomethyl compound specifically indicated by each official report of the combination of o-naphthoquinonediazide-4-sulfonic-acid halo GENIDO indicated by each official report of JP,50-36209,A and 53-8128 and salt plasticity organic dye, JP,53-36223,A and 54-74728, 60-3626, 61-143748, 61-151644, and 63-58440 and salt plasticity organic dye can be mentioned. as this trihalomethyl compound, there are an oxazole system compound and triazine compound, and it passes through both, excels in the Tokiyasu quality, and clear -- appearance is burned and carried out and an image is given.

[0120] Moreover, when the cross-linking compound which has the alkali dissolution depressant action of a publication in the phenolic compound which has a hydroxymethyl group or an alkoxy methyl group an epoxy compound, a vinyl ether compound, and given in a Japanese-Patent-Application-No. No. 18120 [seven to] official report, a Japanese-Patent-Application-No. No. 328937 [nine to] official report, etc. is added, it is desirable in respect of preservation stability.

[0121] Furthermore, in the ingredient which constitutes a recording layer, in order to give flexibility etc. to a paint film if needed, a plasticizer can also be added. For example, oligomer, a polymer, etc. of butyl

phthalyl, a polyethylene glycol, tributyl citrate, a diethyl phthalate, dibutyl phthalate, phthalic-acid dihexyl, a dioctyl phthalate, tricresyl phosphate, tributyl phosphate, trioctyl phosphate, tetrahydrofurfuryl oleate, an acrylic acid, or a methacrylic acid can be used suitably.

[0122] Moreover, the surfactant for improving spreading nature, for example, a fluorochemical surfactant which is indicated by JP,62-170950,A, can be added. A desirable addition is 0.05 - 0.5 % of the weight preferably to the 0.01 - 1-% of the weight part of all the ingredients for recording layers.

[0123] The positive type lithography version can be manufactured by the general manufacture approach of the following lithography versions using the image formation ingredient of this invention. The lithography version is manufactured by melting to a solvent the ingredient which usually constitutes the positive type recording layer in the image formation ingredient of this invention which consists of each above-mentioned component, applying on a suitable base material, melting after that the ingredient which constitutes a chemistry magnification layer to a solvent, and applying on a positive type recording layer. As a solvent used for spreading of a recording layer here Ethylene dichloride, a cyclohexanone, a methyl ethyl ketone, a methanol, Ethanol, propanol, ethylene glycol monomethyl ether, 1-methoxy-2-propanol, 2-methoxy ethyl acetate, 1-methoxy-2-propyl acetate, dimethoxyethane, methyl lactate, Although ethyl lactate, N,N-dimethylacetamide, N,N-dimethylformamide, tetramethyl urea, N-methyl pyrrolidone, dimethyl sulfoxide, a sulfolane, gamma-butyrolactone, toluene, water, etc. can be mentioned, it is not limited to this. these solvents are independent -- or it is mixed and used. The concentration of the above-mentioned component in a solvent (total solids containing an additive) is 1 - 50 % of the weight preferably. Moreover, generally the coverage (solid content) of the positive type recording layer on the base material obtained after spreading and desiccation is 0.2 - 5.0 g/m², when being used as a photosensitive printing version, although it changes with applications. It is desirable and, generally the coverage of a chemistry magnification layer is 0.2 - 5.0 g/m² similarly. It is desirable.

[0124] Although various approaches can be used as an approach of applying, bar coating-machine spreading, rotation spreading, a spray coating cloth, curtain spreading, DIP spreading, the Ayr knife spreading, blade spreading, roll coating, etc. can be mentioned, for example. Although apparent sensibility becomes size as coverage decreases, the coat property of each film falls.

[0125] As a base material, it is a tabular object stable in dimension. For example, paper, plastics The paper (which for example, polyethylene, polypropylene, polystyrene, etc. laminated), A metal plate, plastic film (for example, aluminum, zinc, copper, etc.) for example, diacetyl cellulose, a cellulose triacetate, and cellulose propionate -- A butanoic acid cellulose, a cellulose acetate butyrate, a cellulose nitrate, polyethylene terephthalate, Polyethylene, polystyrene, polypropylene, a polycarbonate, a polyvinyl acetal, etc. can mention the paper in which the metal like the above was laminated or vapor-deposited, or plastic film.

[0126] As a base material used by this invention, polyester film or an aluminum plate is desirable, also in it, dimensional stability is good and especially a comparatively cheap aluminum plate has it. [desirable] A suitable aluminum plate may be an alloy plate which uses a pure aluminium plate and aluminum as a principal component, and contains the different element of a minute amount, and the plastic film with which aluminum was laminated or vapor-deposited further is sufficient as it. There are silicon, iron, manganese, copper, magnesium, chromium, zinc, a bismuth, nickel, titanium, etc. in the different element contained in an aluminium alloy. The content of the different element in an alloy is at most 10 or less % of the weight. Although especially suitable aluminum is pure aluminium in this invention, since manufacture on a refinement technique is difficult for completely pure aluminum, a different element may be contained slightly. Thus, the presentation is not specified and the aluminum plate of the material of well-known official business can be suitably used for the aluminum plate applied to this invention from the former.

[0127] The thickness of the aluminum plate used by this invention is 0.2mm - 0.3mm especially preferably 0.15mm - 0.4mm preferably about 0.1mm - about 0.6mm.

[0128] Although surface roughening of the aluminum plate is carried out and it is used, it precedes carrying out surface roughening and cleaning processing by the surfactant, the organic solvent, or the alkaline water solution in order for a request to remove surface rolling oil can also be performed. Although the surface roughening process of the front face of an aluminum plate is performed by various approaches, it is performed by the approach of carrying out surface roughening mechanically, for example, the approach of carrying out dissolution surface roughening of the front face electrochemically, and the approach of carrying out selective dissolution of the front face chemically. As the mechanical approach, well-known approaches, such as the ball grinding method, a brushing method, the blasting grinding method, and buffing, can be used. Moreover, there is the approach of performing according to an alternating current or a direct current in a

hydrochloric acid or the nitric-acid electrolytic solution as an electrochemical surface roughening method. Moreover, the approach which combined both as indicated by JP,54-63902,A can also be used.

[0129] Thus, anodizing is performed in order that the aluminum plate by which surface roughening was carried out may raise surface water retention and abrasion resistance by request, after alkali-etching-processing and neutralization processing if needed. As an electrolyte used for anodizing of an aluminum plate, use of the various electrolytes which form a porosity oxide film is possible, and, generally a sulfuric acid, a phosphoric acid, oxalic acid, chromic acids, or those mixed acids are used. The concentration of those electrolytes is suitably decided according to an electrolytic class.

[0130] Since the processing conditions of anodic oxidation change variously with the electrolyte to be used, it cannot generally specify, but generally, if electrolytic concentration is 5-70 degrees C, current density 5 - 60 A/dm², electrical potential differences 1-100V, and the range for 10 seconds - electrolysis time amount 5 minutes, it is suitable for a 1 - 80-% of the weight solution, and solution temperature. The amount of anodized coating is 1.0 g/m². If few, print durability is inadequate, or it becomes easy to produce the so-called "blemish dirt" with which a blemish becomes easy to stick to the non-image section of the lithography version with, and ink adheres to the part of a blemish at the time of printing.

[0131] After anodizing is performed, as for an aluminum front face, hydrophilization processing is performed as occasion demands. alkali-metal silicate (for example, sodium-silicate water solution) which is indicated by U.S. Pat. No. 2,714,066, 3,181,461, No. 3,280,734, and No. 3,902,734 as hydrophilization processing used for this invention -- there is law. In this approach, immersion processing of the base material is carried out in a sodium-silicate water solution, or electrolysis processing is carried out. The approach of processing by polyvinyl phosphonic acid which is indicated by the fluoride zirronic acid potassium currently otherwise indicated by JP,36-22063,B and U.S. Pat. No. 3,276,868, 4,153,461, and 4,689,272 etc. is used.

[0132] Between a base material and a positive type recording layer, an under coat can also be prepared if needed. Various organic compounds are used as an under coat component. For example, a carboxymethyl cellulose, The phosphonic acid which has amino groups, such as a dextrin, gum arabic, and 2-aminoethylphosphonic acid The phenylphosphonic acid and naphthyl phosphonic acid which may have a substituent, alkyl phosphonic acid, Organic phosphonic acid, such as glycerophosphonic acid, methylene diphosphonic acid, and ethylene diphosphonic acid, Organic phosphorus acids, such as a phenyl phosphoric acid which may have a substituent, a naphthyl phosphoric acid, an alkyl phosphoric acid, and glycerophosphoric acid, Phenyl phosphinic acid, naphthyl phosphinic acid which may have a substituent, Although chosen out of the hydrochloride of the amine which has hydroxy groups, such as amino acid, such as organic phosphinic acid, such as an alkylphosphine acid and glycerophosphinic acid, a glycine, and beta-alanine, and a hydrochloride of triethanolamine, etc., two or more sorts may be mixed and you may use.

[0133] Moreover, in this invention, said polyfunctional amine compound can also be added to an under coat like previous statement. In this case, an under coat may be formed with an organic compound besides the above, and an under coat may be formed only with a polyfunctional amine compound.

[0134] This under coat can be prepared by the following approaches. The solution made to dissolve an above-mentioned organic compound and/or an above-mentioned polyfunctional amine compound in organic solvents or those partially aromatic solvents, such as water or a methanol, ethanol, and a methyl ethyl ketone, is applied on an aluminum plate. The approach of drying and preparing an under coat, water or a methanol, ethanol, It is the approach of an aluminum plate being immersed in the solution made dissolving an above-mentioned organic compound and/or an above-mentioned polyfunctional amine compound in organic solvents or those partially aromatic solvents, such as a methyl ethyl ketone, making the above-mentioned compound sticking to it, washing and drying bywater etc. after that, and preparing an under coat. By the former approach, the solution of 0.005 - 10% of the weight of the concentration of the above-mentioned organic compound and/or a polyfunctional amine compound can be applied by various approaches. Moreover, by the latter approach, the concentration of a solution is 0.05 - 5 % of the weight preferably 0.01 to 20% of the weight, 20-90 degrees C of immersion temperature are 25-50 degrees C preferably, and immersion time amount is 2 seconds - 1 minute preferably for 0.1 seconds to 20 minutes. Acid, such as alkalis, such as ammonia, triethylamine, and a potassium hydroxide, and a hydrochloric acid, a phosphoric acid, can also adjust the solution used for this in the range of pH 1-12. Moreover, a yellow color can also be added for tone reproduction nature amelioration of the charge of lithography material.

[0135] the amount of covering of an under coat -- 2 - 200 mg/m² suitable -- desirable -- 5 - 100 mg/m² it is . The above-mentioned amount of covering is 2 mg/m². If few, sufficient print durability ability may not be obtained. Moreover, 200 mg/m² It is the same even if large.

[0136] Image exposure and a development are performed to the manufactured lithography version, and it usually forms an image. As the light source of the activity beam of light used for image exposure, there are a mercury-vapor lamp, a metal halide lamp, a xenon lamp, a chemical lamp, a carbon arc lamp, etc., for example. As a radiation, there are an electron ray, an X-ray, an ion beam, far infrared rays, etc. Moreover, g line, i line, Deep-UV light, and a high density energy beam (laser beam) are also used. As a laser beam, a helium neon laser, an argon laser, krypton laser, a helium cadmium laser, a KrF excimer laser, solid state laser, semiconductor laser, etc. are mentioned. In this invention, the light source which has luminescence wavelength in an infrared region from near-infrared is desirable, and solid state laser and especially semiconductor laser are desirable.

[0137] As the developer used for the development of the image formation ingredient of this invention, and a replenisher, the alkali water solution known from the former can be used. Using silicic-acid alkali, it becomes these from the so-called "silicate developer" containing a silicon dioxide, nonreducing sugar, and a base, and there is a "non-silicate developer" which does not contain a silicon dioxide in them on parenchyma. In addition, a "parenchyma top" means permitting existence of the silicon dioxide of the minute amount as an unescapable impurity and a by-product here. In the development process of the image formation ingredient of this invention, although all of said developer are applicable, it is desirable to use a non-silicate developer from a viewpoint of the generating depressor effect of a blemish. Especially as an alkali water solution, the thing of pH 12.5-13.5 is desirable.

[0138] First, a "silicate developer" is described. As said silicic-acid alkali, when it dissolves in water, alkalinity is shown, and alkali-metal silicates, such as a sodium silicate, a potassium silicate, and a silicic-acid lithium, silicic-acid ammonium, etc. are mentioned. Said silicic-acid alkali may be independent one sort, or may be used combining two or more sorts. the mixing ratio of the silicon oxide SiO_2 and alkali oxide M_2O (M expresses alkali metal or ammonium.) said whose alkali water solution is the component of a silicate -- an alkali-metal silicate which can adjust development nature easily, for example, is indicated by JP,54-62004,A and JP,57-7427,B by adjustment of a rate and concentration is used effectively. Also in said alkali water solution, the mixed ratio ($\text{SiO}_2/\text{M}_2\text{O}$: mole ratio) of said silicon oxide SiO_2 and alkali oxide M_2O of the thing of 0.5-3.0 is desirable, and the thing of 1.0-2.0 is more desirable. If said $\text{SiO}_2/\text{M}_2\text{O}$ is less than 0.5, since alkali reinforcement becomes strong, when the evil in which an aluminum plate general-purpose as a base material of the original edition for lithography etc. will be etched may be produced and 3.0 is exceeded, development nature may fall.

[0139] Moreover, as concentration of the silicic-acid alkali in a developer, 1 - 10 % of the weight is desirable to the weight of an alkali water solution, 3 - 8 % of the weight is more desirable, and 4 - 7 % of the weight is the most desirable. When development nature and a throughput may decline when said concentration is less than 1 % of the weight, and it exceeds 10 % of the weight, it becomes easy to generate precipitate and a crystal, and further becomes easy to gel in the case of the neutralization at the time of waste fluid, and trouble may be caused to waste fluid processing.

[0140] Next, a "non-silicate developer" is explained. As described above, it does not consist of nonreducing sugar and a base and nonreducing sugar mean the saccharide which does not have reducibility since it does not have the aldehyde group or ketone group of isolation nature here, and this developer is classified into the glycoside which the trehalose mold oligosaccharide which reduction radicals combined, and the reduction radical and nonsugar of a saccharide combined, and the sugar-alcohol which hydrogenated the saccharide and was returned to it. In this invention, these all can be used suitably.

[0141] As said trehalose mold oligosaccharide, saccharose and trehalose are mentioned and an alkyl glycoside, a phenol glycoside, a mustard oil glycoside, etc. are mentioned as said glycoside, for example. As said sugar-alcohol, D, L-arabite, RIBITTO, xylitol, D, L-sorbitol, D, L-ANNITTO, D, L-idit, D, L-talitol, ZURISHITTO, AROZURUSHITTO, etc. are mentioned, for example. Furthermore, the maltitol obtained by the hydrogenation of disaccharide, the reductant (restoration water candy) acquired by the hydrogenation of an oligosaccharide can be mentioned suitably.

[0142] Among the above, as nonreducing sugar, sugar-alcohol and saccharose are desirable and it is more desirable at the point which has buffer action in pH field where D-sorbitol, saccharose, and a restoration water candy are moderate especially. As a rate of being independent, or combining two or more sorts, and occupying in a developer, these nonreducing sugars have 0.1 - 30 desirable % of the weight, and its 1 - 20 % of the weight is more desirable.

[0143] As a base, conventionally, alkali chemicals can be suitably chosen as said silicic-acid alkali or nonreducing sugar from well-known things, and can be combined with it. As said alkali chemicals, inorganic alkali chemicals, such as a sodium hydroxide, a potassium hydroxide, a lithium hydroxide,

phosphoric-acid 3 sodium, phosphoric-acid 3 potassium, phosphoric-acid 3 ammonium, phosphoric-acid disodium, phosphoric-acid 2 potassium, phosphoric-acid 2 ammonium, a sodium carbonate, potassium carbonate, an ammonium carbonate, a sodium hydrogencarbonate, a potassium hydrogencarbonate, an ammonium hydrogencarbonate, sodium borate, a boric-acid potassium, and ammonium pentaborate, potassium citrate, citric-acid 3 potassium, a sodium citrate, etc. are mentioned, for example. Furthermore, organic alkali chemicals, such as monomethylamine, dimethylamine, a trimethylamine, a monoethyl amine, diethylamine, triethylamine, mono-isopropylamine, diisopropylamine, TORIISOPUROPIRUAMIN, n butylamine, monoethanolamine, diethanolamine, triethanolamine, monoisopropanolamine, G SOBUROPANORUAMISHI, ethyleneimine, ethylenediamine, and a pyridine, can also be mentioned suitably. These alkali chemicals may be used independently or may be used combining two or more sorts. [0144] Especially, a sodium hydroxide and a potassium hydroxide are desirable. The reason is because pH adjustment is attained in large pH field by adjusting the addition to nonreducing sugar. Moreover, since phosphoric-acid 3 sodium, phosphoric-acid 3 potassium, a sodium carbonate, potassium carbonate, etc. have buffer action in itself, it is desirable.

[0145] Furthermore, it is known that a lot of lithography versions can be processed, without exchanging the developer in a developing tank for a long time by adding a water solution with alkali reinforcement higher than a developer (replenisher) to a developer, in developing negatives using an auto-processor. Also in this invention, this supplement method is applied preferably. In a developer and a replenisher, various surfactants and organic solvents can be added if needed in order to raise the parent ink nature of promotion of development nature, control, distribution of development dregs, and the printing version image section. As a desirable surface active agent, an anion system, a cation system, the Nonion system, and an amphoteric surface active agent are mentioned. Furthermore, reducing agents, such as sodium salt of inorganic acids, such as hydroquinone, resorcinol, a sulfurous acid, and sulfurous-acid hydro acid, and potassium salt, and also an organic carboxylic acid, a defoaming agent, and a water softener can also be added to a developer and a replenisher if needed.

[0146] After treatment of the lithography version by which the development was carried out using the above-mentioned developer and the replenisher is carried out with the rinse containing rinsing water, a surface active agent, etc., and the desensitization liquid containing gum arabic or a starch derivative. As after treatment in the case of using it as a printing version, the charge of lithography material of this invention can be used combining various these processings.

[0147] In recent years, in platemaking / printing industry, the auto-processor for the printing versions is widely used for rationalization of a platemaking activity, and a standardization. The lithography version using the charge of lithography material of this invention can also be processed with this auto-processor. Generally this auto-processor consists of the development section and the after-treatment section, consists of the equipment, each processing cistern, and spray equipment which convey the printing version, and it sprays and carries out the development of each processing liquid pumped up with the pump from a spray nozzle, conveying the printing version [finishing / exposure] horizontally. Moreover, how to make carry out immersion conveyance of the printing version with a guide-among liquid roll etc. into the processing cistern with which processing liquid was filled, and process is also learned recently. It can process in such automatic processing, supplementing each processing liquid with a replenisher according to throughput, the operating time, etc. Moreover, the so-called disposable mode of processing substantially processed with intact processing liquid is also applicable.

[0148] When there are the image sections (for example, the remains of a film edge of a subject-copy film etc.) unnecessary on the lithography version after image exposure, development, rinsing, a rinse, and/or gum length are given, the measures which eliminate the unnecessary image section can also be taken. Although the approach of rinsing after it applies to the unnecessary image section elimination liquid which is indicated by JP,2-13293,B as the elimination approach, for example and predetermined carries out time amount neglect as it is is desirable, the approach of developing, after irradiating the activity beam of light drawn with an optical fiber which is indicated by JP,59-174842,A at the unnecessary image section can also be used.

[0149] Presswork can be presented with it after the lithography version by which more than was processed applies desensitization gum by request. Burning processing may be performed in order to raise print durability. When carrying out burning processing of the lithography version, it is desirable to process with counter etching liquid which is indicated by each official report of JP,61-2518,B, 55-28062, JP,62-31859,A, and 61-159655 before this burning processing. The approach of immersing for it and applying the lithography version as the approach into the bat which applied on the lithography version or filled counter

etching liquid with sponge and the absorbent cotton into which this counter etching liquid was made to soak, spreading by the automatic coating machine, etc. are applied. Moreover, it is more desirable, when the coverage is made into homogeneity with a squeegee or a squeegee roller after applying. Generally 0.03 - 0.8 g/m² (dry weight) is suitable for the coverage of counter etching liquid.

[0150] After drying the lithography version with which counter etching liquid was applied, you may heat to an elevated temperature by a burning processor (for example, burning processor currently sold from Fuji Photo Film Co., Ltd. : "BP-1300") etc. Although whenever [stoving temperature / in this case], and time amount are based also on the class of component which forms the image, its range for 1 - 20 minutes is desirable in 180-300 degrees C.

[0151] the processing to which the lithography version by which burning processing was carried out is suitably carried out from the former, such as rinsing and gum length, if needed -- ***** -- although things are made, when the counter etching liquid containing a water soluble polymer compound etc. is used, the so-called desensitization processing of gum length etc. can also be omitted.

[0152] The lithography version obtained by such processing is built into the offset press etc., and is used for printing of a form etc.

[0153]

[Example] Hereafter, although an example explains this invention to a detail, this invention is not restricted to these.

[0154] [Examples 1-6]

After carrying out trichloroethylene washing of the aluminum plate (quality of the material 1050) with a <production of base material> thickness of 0.30mm and degreasing, the front face was grained using a nylon brush and the PAMISUTON-water suspension of 400 meshes, and it often washed with water. It etched by being immersed in a sodium-hydroxide water solution for 9 seconds 25 45-degree C%, and it was immersed in HNO₃ for 20 seconds 2 more% after rinsing, and this plate was rinsed. The amounts of etching on the front face of graining at this time were about 3g/m². Next, the direct-current anodized coating of 3 g/m² was prepared by current density 15 A/dm², having used 7%H₂SO₄ as the electrolytic solution for this plate. Then, rinsing desiccation was carried out after immersion for 1 minute at 70-degree C 2.5% water solution of silicate of soda. Next, the under coat liquid of the following presentation was applied to this aluminum plate, and it dried for 30 seconds at 80 degrees C. The amount of covering after desiccation was 20 mg/m².

[0155]

(Presentation of under coat liquid)

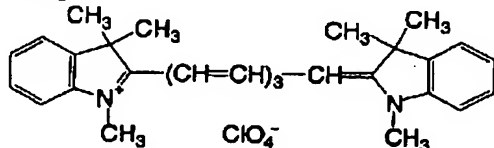
- A 4-diazo diphenylamine, and phenoxyacetic acid and formaldehyde Dibutyl naphthalene sulfonic acid of a condensate 0.1g - methanol 100g [0156] Positive type recording layer coating liquid [of the presentation below <formation of a positive type recording layer>] (a) - (f) was prepared, this solution was applied to the aluminum plate [finishing / the above-mentioned under coat], was dried for 2 minutes at 100 degrees C, and plate [of 1.0 g/m²] (a) - (f) was obtained.

(Presentation of positive type recording layer coating liquid (a))

- m, a p-cresol novolak (m/p ratio = weight Taira 6/4) Division-into-equal-parts **** 3500, 0.5 % of the weight content of unreacted cresol The 50 sections - infrared absorption agent (IR-1) The two sections - succinic-acid anhydride The three sections - fluorochemical surfactant The 0.5 sections (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make)
- Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The 400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0157]

[Formula 28]

[R - 1



[0158]

(Presentation of positive type recording layer coating liquid (b))

- Phenol-formaldehyde novolak (Mw=10000) The 50 sections - infrared absorption agent (IR-1) The two sections - fluorochemical surfactant The 0.5 sections (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make)
- Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The

400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0159]

(Presentation of positive type recording layer coating liquid (c))

- Polyhydroxy styrene (Mw=20000) The 50 sections - infrared absorption agent (IR-1) The two sections - fluorochemical surfactant The one section (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make) - Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The 400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0160]

(Presentation of positive type recording layer coating liquid (d))

- Phenol-formaldehyde novolak (Mw=10000) The 40 sections - polyhydroxy styrene (Mw=20000) The ten sections - infrared absorption agent (IR-1) The two sections - succinic-acid anhydride The one section - fluorochemical surfactant The 0.5 sections (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make) - Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The 400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0161]

(Presentation of positive type recording layer coating liquid (e))

- m, a p-cresol novolak (m/p ratio = weight Taira 6/4) Division-into-equal-parts **** 3500, 0.5 % of the weight content of unreacted cresol The 30 sections - phenol-formaldehyde novolak (Mw=10000) The 20 sections - infrared absorption agent (IR-1) The two sections - succinic-acid anhydride The 2.5 sections - fluorochemical surfactant The 0.1 sections (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make) - Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The 400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0162]

(Presentation of positive type recording layer coating liquid (f))

- m, a p-cresol novolak (m/p ratio = weight Taira 6/4) Division-into-equal-parts **** 3500, 0.5 % of the weight content of unreacted cresol The 35 sections - polyhydroxy styrene (Mw=20000) The 15 sections - infrared absorption agent (IR-1) The two sections - succinic-acid anhydride The 1.5 sections - fluorochemical surfactant The 0.1 sections (megger fuck F-177; Dainippon Ink & Chemicals, Inc. make) - Coloring agent (VPB-Naps; product made from Hodogaya Chemistry) The 0.1 sections - methanol The 400 sections - gamma-butyrolactone The 400 sections - water The 80 sections [0163] Chemistry magnification layer coating liquid [of the presentation below <formation of a chemistry magnification layer>] (p) - (r) was prepared. On (Plate a) - (f) in which the positive type recording layer was formed on the under coat of the base material obtained the account of a top, it applied so that it might become the combination of Table 1 about chemistry magnification layer coating liquid [of the following presentation] (p) - (r), and it dried for 1 minute, the lithography version of 1.8 g/m² was obtained, and the 100 degrees C (image formation ingredient) of the lithography versions of examples 1-6 were obtained.

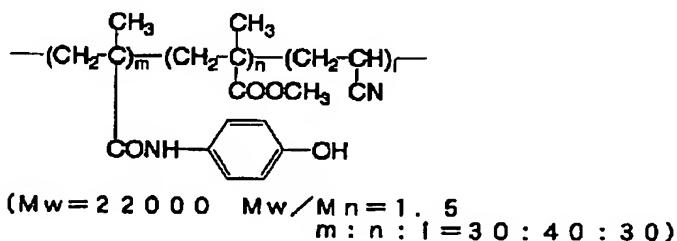
[0164]

(Presentation of chemistry magnification layer coating liquid (p))

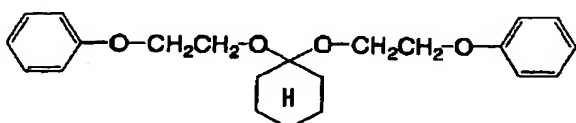
- Binder P (the following structure) The 60 sections - acidolysis compound A (the following structure) 20 section and an acid generator (2-TORIKURORO methyl-5-[beta- ()] [2-BENZOFURI] RU vinyl)- 1 and 3 -- 5-OKISA diazole The five sections - infrared absorption agent (IR-1) The two sections - propylene glycol monomethyl ether The 700 sections - toluene The 300 sections [0165]

[Formula 29]

バインダー P



酸分解化合物 A



[0166]

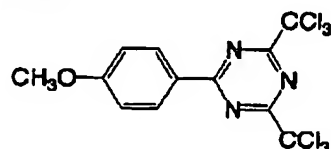
(Presentation of chemistry magnification layer coating liquid (q))

- Binder P (the above-mentioned structure) The ten sections - phenol /m, p-cresol novolak resin The 60 sections (phenol / m-cresol / p-cresol ratio =20/48/32, the number average molecular weight 500, weight average molecular weight 2500)

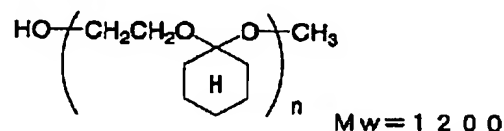
- An acid generator A (the following structure) The three sections - acidolysis compound B (the following structure) The 25 sections - infrared absorption agent (IR-1) The two sections - propylene glycol monomethyl ether The 700 sections - toluene The 300 sections [0167]

[Formula 30]

酸発生剤 A



酸分解化合物 B



[0168]

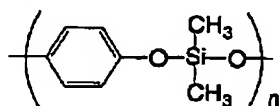
(Presentation of chemistry magnification layer coating liquid (r))

- Binder P (the above-mentioned structure) The ten sections - phenol /m, p-cresol novolak resin The 60 sections (phenol / m-cresol / p-cresol ratio =20/48/32, the number average molecular weight 500, weight average molecular weight 2500)

- An acid generator A (the above-mentioned structure) The three sections - acidolysis compound C (the following structure) The 25 sections - infrared absorption agent (IR-1) The two sections - propylene glycol monomethyl ether The 700 sections - toluene The 300 sections [0169]

[Formula 31]

酸分解化合物 C



[0170]

Table 1

	平版印刷版(層構成)		感度 (mJ/cm ²)
	ボシ型感光層	化学増幅層	
実施例1	a	p	125
実施例2	b	p	135
比較例1	-	p	175
実施例3	c	q	120
実施例4	d	q	115
比較例2	-	q	165
実施例5	e	r	130
実施例6	f	r	130
比較例3	-	r	185

[0171] On the base material which prepared the under coat used in the [examples 1-3 of comparison] examples 1-6, said chemistry magnification layer spreading solution (p), (q), and (r) were applied so that it might become 1.8 g/m², respectively, and the lithography version which recorded only the chemistry

magnification layer was obtained, and it considered as the examples 1, 2, and 3 of a comparison, respectively.

[0172] Based on the following criteria, the performance evaluation was performed about each lithography version of the examples 1-6 produced as mentioned above and the examples 1-3 of a comparison.

[0173] The lithography version of the <evaluation of image formation nature and sensibility> examples 1-6 and the examples 1-3 of a comparison was exposed using semiconductor laser with a wavelength of 840nm. Negatives were developed after exposure using the auto-processor ("PS processor 900VR", Fuji Photo Film Co., Ltd. make) which prepared the developer of the following presentation.

[0174]

(Presentation of a developer)

- 1K potassium silicate The 3.0 weight sections - potassium hydroxide The 1.5 weight sections -C₁₂H₂₅-C₆H₄-O-C₆H₄-SO₃Na The 0.3 weight sections - water The 95.2 weight sections [0175] The line breadth of the non-image section of each lithography version obtained with the developer was measured, and it asked for the exposure energy of the laser equivalent to the line breadth, and considered as the index (mJ/cm²) of sensibility. It is shown that the sensibility of the lithography version is so high that this measured value (mJ/cm²) is small. The result of each above evaluation is shown in said table 1.

[0176] From the above-mentioned result, the lithography version of examples 1-6 was understood that the sensibility to infrared laser is high also in which combination compared with the lithography version of the examples 1-3 of a comparison. On the other hand, it was checked that the lithography version of the example of a comparison using only the chemistry magnification layer as a recording layer is inadequate in respect of sensibility.

[0177]

[Effect of the Invention] According to this invention, using the solid state laser and semiconductor laser which irradiate infrared radiation, it can engrave from digital data, such as a direct computer, and the image formation ingredient of a high sensitivity positive type can be obtained to the above-mentioned infrared laser.

[Translation done.]

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